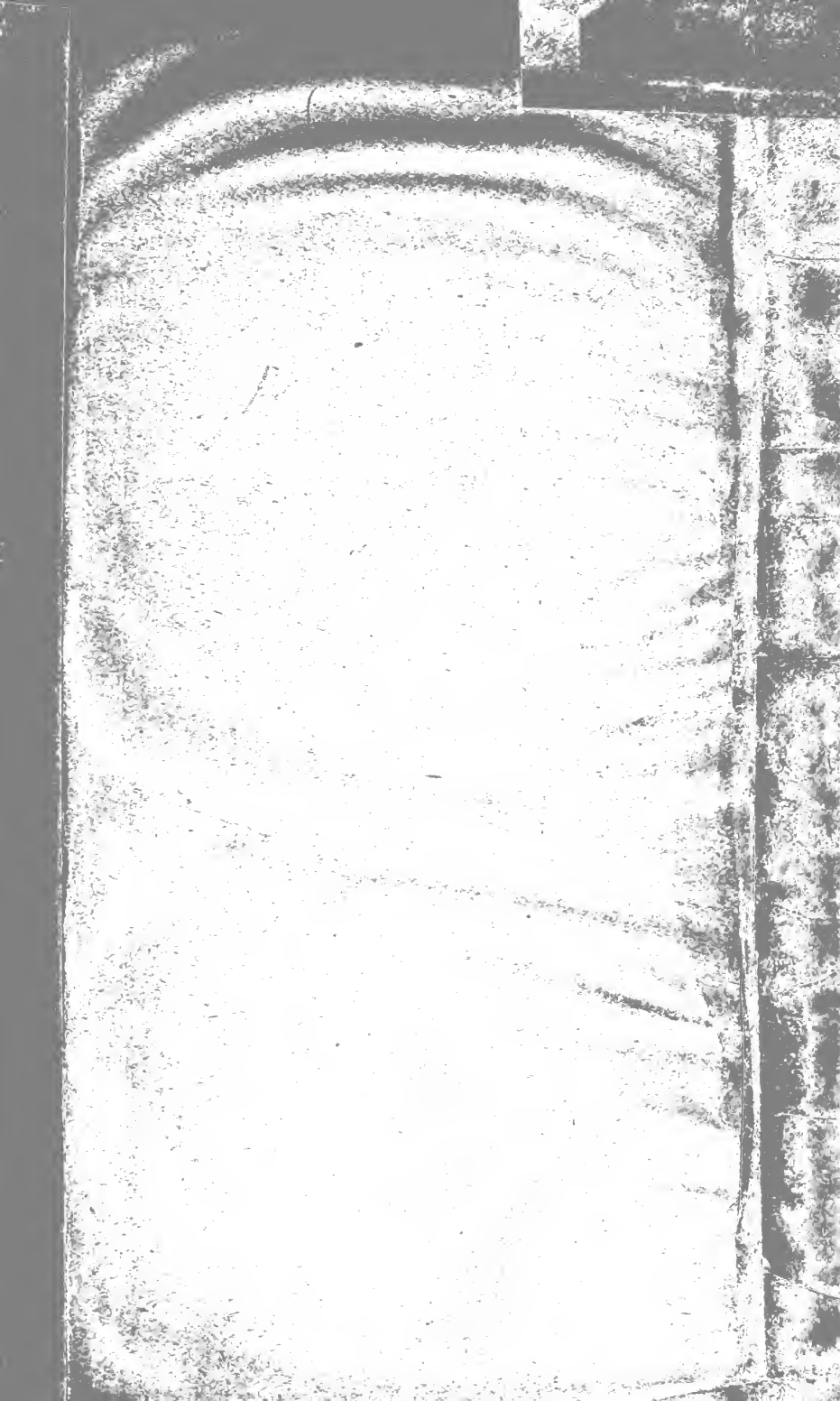

THE

INSURANCE GUIDE

AND

HAND-BOOK.

BEING

A GUIDE TO THE PRINCIPLES AND PRACTICE OF LIFE ASSURANCE; AND A HAND-BOOK OF THE BEST AUTHORITIES ON THE SCIENCE.

BY THE LATE

CORNELIUS WALFORD, F.I.A.

THIRD EDITION

BY

ARTHUR WYNDHAM TARN, F.I.A.

(OF THE WESTMINSTER AND GENERAL LIFE ASSURANCE ASSOCIATION), SAMUEL BROWN PRIZEMAN OF THE INSTITUTE OF ACTUARIES, AND AUTHOR OF "SOME NOTES ON LIFE ASSURANCE IN GREATER BRITAIN,"

WITH ARTICLES ON

ACCIDENT INSURANCE,

BY C. H. GREEN

(OF THE SUN LIFE ASSURANCE SOCIETY),

AND ON

FIRE INSURANCE,

BY CHARLES EDWIN NOVERRE

(LONDON MANAGER OF THE NORWICH UNION FIRE INSURANCE SOCIETY).

LONDON:

CHARLES AND EDWIN LAYTON,

56, FARRINGDON STREET, E.C.

1900.

THE

INSURANCE GUIDE AND HAND-BOOK.

PREFACE TO THIRD EDITION.

In undertaking, at the request of the Publishers, to revise such a classical work as Walford's Insurance Guide and Hand-Book, the present Editor could not but recognize that his task was surrounded by peculiar difficulties—difficulties which, as the revision went on, seemed to become almost insuperable. The long interval—close upon one-third of a century—which had elapsed since the Second Edition was published, and during which so many important changes had taken place both as regards Actuarial Science and in the general practice of Life Offices, made it imperative for the bulk of the Guide to be entirely re-written. Again, as a result of the adoption of this course, the Editor felt that he must not expect to present to his readers the various subjects treated in the Work in as graphic and attractive language as flowed from the pen of the late Mr. Walford in the earlier Editions. He has also found it impossible, in the limited space at his command, to do adequate justice to the wide and ever-expanding scope which is now covered by the various topics affecting the Theory and Practice of Life Assurance.

Notwithstanding these difficulties, however, the Editor must confess to having found his task an agreeable and interesting one, since it has necessitated his consulting a very large number of authorities bearing either directly or indirectly upon the particular aspects of his subject, and thus ascertaining the matured—and occasionally, it may be added, the divergent—opinions of the leaders, both past and present, of the profession to which he has the honour to belong. The results of his researches he has embodied in different parts of the Work, in which are given a considerable number of quotations from and references to such authorities. These, it will be noticed, are for the most part extracted from that mine of information on all points relating to Life Contingencies, the *Journal of the Institute of Actuaries*—referred to as "*J.I.A.*" in the foot-notes.

The Editor would here like to observe that, in arranging his subjects, he has endeavoured, as far as it has been practicable, to avoid departing from the well-considered plan of the GUIDE originated by Mr. Walford. He has retained, with a few unimportant corrections and eliminations rendered necessary by altered conditions, such of the historical portions of the Work as related to the development of Life Assurance and to the Rate of Interest. The description of the progress of Life Assurance during the last forty years is, however, entirely fresh matter, for which the Editor is alone responsible.

The earlier editions of the GUIDE were, it may be remembered, "dedicated especially to Insurance Agents." This fact the present Editor, in the course of his revision, has not overlooked. On the contrary, it has been one of his main objects to place before this section of his readers, in a popular manner, the leading principles upon which Life Assurance, as regards both its Theory and Practice, should be based. For those, too,—whether students or fully-qualified actuaries—who desire to form a closer acquaintance with these principles, he may express the hope that such chapters as those on the various Mortality Tables—which he has made as complete as possible—on the Comparative Risks of Occupation, on the Rise and Progress of Industrial Assurance, and on Life Assurance in the United States and the Colonies, will be considered both serviceable and instructive. The GUIDE, however, should not be regarded as in any sense a Text-Book, but merely as a supplement to those far more erudite works which, under the superintendence of the Institute of Actuaries, have been compiled with the object of assisting students in their examinations.

To the Appendices at the end of the Volume the Editor has devoted particular attention, and he trusts that for purposes of reference they may be considered as not the least useful part of the GUIDE. For the greater portion of Appendix A. he is indebted to the courtesy of his friend, Mr. T. J. W. Buckley, the genial Editor and Proprietor of the *Post Magazine*, this having formed part of a List of Insurance Offices of all kinds, which was tabulated chronologically for that paper by Mr. Walford in 1885, but which, unfortunately, he left uncompleted at his death in that year. Mr. Walford's List having been brought down only as far as the year 1863, the names and fates of the Life Assurance Companies

subsequently established have been extracted by the present Editor from successive numbers of the *Post Magazine Almanack.* His sincere acknowledgments are also due to the Council of the Institute of Actuaries for permitting him to reprint, in Appendix C., certain functions deduced from the H^M and Dr. Sprague's Select Life Tables.

Since the main portion of this work was written and had passed into the printers' hands, a suggestion from an influential quarter was made that by the addition of some practical remarks on the growth and present position of the important and kindred subjects of Fire and Accident Insurance, the GUIDE might be rendered more serviceable to the Insurance world in general. Accordingly, with this object in view, application was made to two well-known authorities upon these particular branches of Insurance. The results of such application may be seen in the two brief articles which appear at the end of the work, and which, it is hoped, may help to make it as complete an "Insurance Guide" as its limited compass will allow.

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INSURANCE GUIDE

AND

HAND-BOOK.

CHAPTER I.

HISTORICAL REVIEW.

"It would be an interesting and instructive exercise to trace minutely the origin and progress of Life Assurance in this country. To do so thoroughly it would be necessary to take notice of the advances made at different times and places in collecting the facts regarding human life and mortality; which, while they form the basis of Life Assurance, have, at the same time, other important uses. It would be requisite also to show the progress made by successive writers in the development of the Science of Probabilities, as deduced from these data; and finally, to mark the growth of Life Assurance as a scheme of business gradually gaining acceptance with the community, and now covering the land with prosperous institutions, which are yearly dispensing their benefits among innumerable families."—*North British Review.*

If we are to believe the records which have been handed down to us, the progress of the Insurance principle in this Kingdom has not been without its romance. Persons, who, for the first time, direct their attention to the practice of modern Assurance, affect to be startled at the expansive character it has assumed. They discover that not only may they insure their ships against the fury of the waves—their houses and property against the dire calamity of FIRE—or (still more important), make suitable provision for those dependent upon them in the event of their untimely removal by *death*—but that they may secure compensation in the event of loss of sight—for broken limbs by railway mis-management—for broken heads by midnight bandits—the casualties of the chase—or the frightful risks of the battle-field. They may insure their crops against the devastation of hail-storms—their plate-glass against the carelessness of servants, or damage by evil-disposed persons,—their cows and horses against the ravages of disease,—their ledgers against bad debts. Race-horses may be assured against the *in*fidelity of their grooms—

and clerks may have *their fidelity* guaranteed. Property-holders may have their titles secured, and sleep without fear of ejectment,—Copyholds and Leaseholds may be made equal to Freeholds,—School and College *Endowments* may be provided. All this and much more, is done by modern Assurance!

But if the applications of modern Assurance are so multiform, what will our readers say to the earlier Insurance schemes, when they come to learn more of them? We should simply subject ourselves to the charge of romancing if we were, thus early, to rend aside the veil of a century, and assert the existence of Companies for Insuring against Housebreakers and Highwaymen,—*against lying*, or death by *drinking Geneva!* Yet the climax of that period—(the era of the South Sea bubble)—was only reached by a scheme in 'Change-alley for the insurance of *female chastity*, and another against *Divorces!** A little later these outrages degenerated into "little goes," and "Insurance Wagers." *Then*, as a popular writer has observed, any public event would do for a venture. Wilkes in the Tower,—Lord North in disgrace with the people, were scheduled in broker's books as good subjects. Successes or disasters in war,—the seals of a Prime Minister, or the life of a highwayman,—all served the purpose of the policy-mongers, if by them they "put money in their purse." Large sums were paid by the Underwriters at Lloyd's, who speculated upon the failure of a young fellow who had undertaken, for a wager, to go to Lapland, and bring back within a given time two *rein-deer*, and two *Lapland females*—and did it! But we will not further anticipate the course of events.

The various systems of Insurance and Assurance,† as now practised, are mostly of modern adaptation; and although some of them have arrived at a great point of development, the progress has been slow, and sometimes involved in mystery. This progress we now desire to trace; believing that a knowledge of the circumstances which have led to improvements in the past, may lead to still further improvements in the future; and also believing that those who are now intimately associated with the practice—either as *agents*, or in higher, if not more useful capacities—will not feel the less interested in their labours by a larger acquaintance with the struggles and triumphs which have ensued, from the period of the first glimmerings of the theory (where we can trace them) down to its complete recognition as a science—or even until *now*, when its practice is working a financial change in the wealth and commercial relations of this country; and a great social change in the habits and comforts of

* Hone, in his famous *Every-day Book*, gives, *inter alia*, the following list of Companies established in the period we are speaking of:—For breeding and feeding cattle;—for making paste-board;—for a grand dispensary;—a royal fishery, and a fish pool;—for making glass bottles;—for discovering gold-mines;—for *an assurance against thieves;*—for dealing in hops;—for a flying machine;—for *insuring of horses;*—for feeding hogs;—for curing the gout and stone;—for an air-pump for the brain;—for *insurance against divorces;*—for making butter from beech trees;—for a perpetual motion;—for making deal-boards of sawdust.

† A useful, if not always practicable, distinction between the two has been set up. "*Assurance* is a contract dependent on the duration of life, which must either happen or fail. *Insurance* is a contract relating to any other uncertain event which may *partly* happen or *partly* fail: thus, in adjusting the price for Insurance of houses and ships, regard is always had to the chance of salvage arising from partial destruction."—*Babbage.*

the people. By these means we shall seek to unite the past with the present, and to imply the probabilities of the future.

That we may not be able to say much that is *new*, on a subject which has been so thoroughly canvassed, we are prepared to admit; but if we shall succeed in making understandable and popular to the reader, much that is now locked up in the libraries of the learned—in rescuing from a deluge of mathematical formulæ or scientific mystification (totally incomprehensible to the great majority of those by whom the *real work* of Assurance and Insurance is carried on), those gems from the "great masters" which have raised the science to what it now is—those principles which no longer need algebraical demonstration—we shall consider we have lent service to the cause we have espoused—different in kind, truly, but no less important for practical purposes—than if we had written one of the most learned treatises the world has ever welcomed, though failed to understand!

FIRST INDICATIONS.

Without encumbering our subject with lengthened researches into Ancient History, or attempting to prove or disprove that Greece and Rome, in addition to the many good and noble institutions they possessed, are also entitled to the credit which has been claimed for them, of having laid the foundation of the great principles of Insurance, we purpose to take a slight historical glance at the progressive development of those principles in this kingdom, or elsewhere, as our subject may lead us. It is more than probable that our own good King Alfred, amongst the many wise laws and institutions he originated for his subjects, laid down the first principles of mutual association and combination for good purposes. At all events it is quite clear "that associations founded on mutual principles, in which union for good or for ill, and in which provision was made for contingencies, were the prominent features, are to be found in our Saxon annals." This is the dictum of Mr. Francis,* who has been at some pains to investigate the subject. He continues, "the axiom that 'union is strength,' the necessity of providing for casualties by Mutual Assurance, in other words, Assurance on its broadest and most rational basis, was practised in the Saxon Guild, the origin of which was very simple. Every freeman of fourteen being bound to find sureties to keep the peace, certain neighbours composed of ten families became bound for one another, either to produce any one of the number who should offend against the Norman law, or to make pecuniary satisfaction for the offence. To do this, they raised a fund by mutual payments, which they placed in one common stock. This was pure Mutual Assurance. From this arose other fraternities." Of the nature of these other fraternities we may give one or two examples. Here is one of the rules of the St. Catherine's Guild:—"If a member

* Francis' *Annals, &c., of Life Assurance*, 1853. Whatever may be thought of Mr. Francis' book, taken as a whole—and it has been very severely criticised—it certainly presents amongst a great deal of romance some useful information regarding the development of the Science of Life Contingencies in this country, and such as we have not met with in more learned performances. As a *History of the Science of Life Contingencies* its claims are but very slender.

suffer from fire, water, robbery, or other calamity, the Guild is to lend him a sum of money without interest." By the regulations of a similar society at Exeter, "When any member is about to go abroad, each of his fellow-members shall contribute five-pence; and if any member's house is burnt, one penny." These rules read as fresh as if they were only just certified by the hand of our immortal Tidd Pratt. Here is one of another kind, taken from a Cambridge society of Saxon date:—"If any one shall take away the life of a member his reparatory fine shall not exceed *eight pounds;* but if he obstinately refuse to make reparation, then shall he be prosecuted by and at the expense of the whole society; and if any individual undertake the prosecution, then each of the rest shall bear an equal share of expenses. If, however, a member who is poor kill any one, and compensation must be made, then, if the deceased was worth 1,200 shillings, each member shall contribute half a mark [equal in weight to about £2. 1*s.* 3*d.* of our silver coinage]; but if the deceased was a hind, each member shall contribute two oræ [equal to 10*s.* 4*d.* present coinage];—if a *Welchman*, ONLY ONE!"

It is known that after the conquest, Guilds were established for the express promotion of religion, charity, or trade; "and from these fraternities" (says a modern writer) "the various Companies and City Corporations have arisen." In none of these early societies, however, do we observe any risks undertaken other than those against such casualties as could be taken easy note of. The doctrine of probabilities, as applying to the higher class of risks, had still to be developed. We fully agree, however, with Mr. Frederick Hendriks that "the non-existence in ancient times of the theory of probabilities as a science, or as anything beyond a philosophical idea of the weight of testimony, cannot be accepted as a reason for the unlikelihood of the early practice of Insurance."

MARINE INSURANCE.

It is now admitted by all writers that Maritime casualties were the first to which the principles of Insurance (as distinguished from the friendly contributions before referred to) were applied. So far back as the year 1435 the magistrates of Barcelona issued an Ordnance relating to this class of Insurance, which we have good authority for stating "should be reputed as the first instrument of legislation known up to that period in Europe." Mr. Lewis Pocock, in his interesting book on Life Assurance, says—"The proportionate hazard of different voyages which constituted the essential quality of Marine Insurances appears, however, to have been understood so early *that something approaching to the principle* seems to have been employed in the later ages of Rome, by which vessels lost at sea or taken by the enemy were to be replaced, in return for supplies furnished to the army in Spain. This agreement of indemnification," he continues, "may be considered an Assurance, *though defective in the modern condition of a premium.*" But a no less legal authority than the late Mr. Baron

Parke held that this bore "no resemblance to the contract of Insurance, for it is (he says) nothing more than every well regulated State is bound to do by the ties of natural justice." And he adds, "it is equitable and right that those who, in times of public danger, appropriate their private wealth to the advancement of the public service, should be reimbursed from the purse of the State for the losses they may sustain." We will not add to the number of writers who have already entered the ranks of controversy on this question, but will take the award of Mr. Hendriks (after he had fully investigated the claims on both sides) as just and equitable between them, viz., that the contract of nautical interest, or loan on bottomry, or respondentia, was used from very remote ages by the Greeks, Romans, and other nations, as their ordinary Insurance contract, which end it perfectly answered; and that eventually *it formed the traditionary groundwork on which arose the superstructure of the Insurance system of modern Europe.* And this is the point we seek to arrive at.

In the 16th century the principle of Marine Insurance is known to have existed in Italy, the Netherlands, and *Britain.* The earliest mention of it occurs in 1548, in a letter written by Protector Somerset to his brother the Lord Admiral. That it was commonly understood in 1558, may be gathered from the speech of Lord Keeper Bacon, on opening Queen Elizabeth's first parliament, wherein he said, "doth not the wise merchant, in every adventure of danger, give part to have the rest assured?" In the 17th century, the Lombards, who had settled in this country a century or two previously, greatly distinguished themselves in this branch of business, and Marine policies issued at Antwerp, so early as 1620, were expressed to be made "according to the custom of the Lombards, in Lombard Street, London."*

The first English statute relating to Marine Insurance was passed in 1601. It is entitled "An acte concerninge matters of Assurances amongste merchantes," and its preamble furnishes some information strictly to our present purpose:

"Whereas it ever hathe bene the policie of this realme by all good means to comforte and encourage the merchante, therebie to advance and increase the generall wealth of the realme, her Majestie's customes, and the strength of shippinge, which consideration is nowe the more requisite because trade and traffique is not at this present soe open as at other tymes it hath bene. And whereas it hathe bene *tyme out of mynde* an usage amongste merchantes, bothe of this realme and of forraine nacyons, when they make any greate adventure (speciallie into remote partes) to give some consideracion of money to other persons (which commonlie are in no small number) to have from them assurance made of their goodes, merchandizes, ships, and things adventured, or some parts thereof, *at such rates*, and in such sorte as the parties assurers and the parties assured can agree, which course of dealinge is commonlie termed a *policie of assurance;* by means of which policie if it cometh to passe, upon the losse or perishinge of any shippe, there followethe not the undoinge of any man, but the losse lightethe rather easilie upon many, than heavilie upon fewe, and rather upon them that adventure not, than those that do adventure; whereby all merchantes, speciallie the younger sorte, are allured to venture more willinglie and more freelie."

* G. D. B. Beaumont on the Law of Insurance.

It then enacts certain regulations to be observed for the advantage of both assurers and assured.

It has been asserted, with some shadow of authority, that we are indebted to the Jews for the origin of Marine Insurance. The French writers, especially, have taken this view. They fix the date of the invention 1182, when the Jews were banished from France, and "took that mode to facilitate and secure the removal of their effects." The Lombards, these writers assert, "were not idle spectators of this contrivance." They adopted it, and, as we have already stated, "in a short time improved it considerably." We quote from Mr. Baron Parke. The authorities he consulted affirmed that the Jews, upon this occasion, invented *Bills of Exchange*, but he found none which credited them with having originated policies of Insurance.*

The first attempt to organise a corporation for the purposes of this branch of Insurance, of which we have any record, was made in Holland, under the sanction and support of governmental authority, and dates no further back than the commencement of the 17th century. In 1629 the States-General presented to the deputies of the various provinces the plan of a *general chamber or Company of Insurance*, urging that "they were persuaded that this Company or General Chamber of Insurance, once put into train, the merchants could carry on a much securer trade by sea than heretofore; and that besides, it would afford a means of releasing the provinces from the large extraordinary subsidies which the latter declared they could no longer continue." The plan was to be made compulsory under pains and penalties of the severest nature. It provided specific rates of premium for voyages to and from the chief foreign ports. The Proprietors and Directors were to be responsible to the extent of their subscribed shares. The States-General were to subscribe four million of florins, two-thirds on account of their share in the risks of profit and loss, the remaining third being ceded as a gift to the Company; and it was intended to make it a trading as well as an Insurance Company, giving it a monopoly of the Dutch trade in the Levant. The merchants to whom the matter was referred "unanimously determined that such a Company would be *disadvantageous to the general commerce of those provinces, and burdensome to those branches of trade in particular, and to that which is more especially devoted to the fitting out and freighting of ships.*"† And so the matter ended for a time.

The following passage from Leybourn's *Panarithmologia*,‡ published in 1693, explains quaintly enough the practice of *Marine* Insurance at that period, and the value in which it was held.

* *Vide J.I.A.*, Vol. ii., p. 145.

† *Vide* Mr. F. Hendriks' excellent papers in 4th Vol. of *J.I.A.*

‡ The *Panarithmologia* was:

"A { Mirror / Breviate / Treasure / Mate } for { Merchants. / Bankers. / Tradesmen. / Mechanicks.

And a Sure Guide for Purchasers, Sellers, or Mortgagers of Land, Leases, Annuities, Rents, Pensions, &c., in present Possession or Reversion, and a *constant Concomitant* fitted for *all Men's occasions*. Calculated and Published by W. Leybourn, 1693."

"Assurance (he says) is when you are in any manner of fear of the ship your goods are in, or the danger of the voyage, or of pirates, &c. You then are willing to give another man a certain sum of money to put himself in your place, and if any danger arises, to pay you for the same goods the value that you have assured. It is a thing that hath been long in custom and use amongst traders, and was established by a law under *Claudius Cæsar*, before the birth of CHRIST; *it hath been much practised in all trading nations, and is a cause of great increase of trade*, because that hazard is borne by four or five* with mutual consent, which otherwise must fall upon one person. The nature of it is thus: Suppose you ship £300 of goods for Jamaica, you being unwilling to run so great a hazard yourself; you go to the Assurance Office *behind the Royal Exchange, in London*, and there acquaint the clerk you will *ensure* for £200, or £250, or, if you will, the whole £300 (for you may ensure the whole or any part) upon such a ship, for so much goods as you have on board."

But in those days, as now, dishonest practices had crept in, and had to be guarded against by those who granted insurances, while those who insured had to see that they committed their risks to honest and trustworthy persons: hence these additional observations were made by the same writer:—"Those assurances are most dangerous when they have the words inserted 'lost or not lost,' which is commonly done when a ship hath been long missing, and no tidings can be had; the *premiums* (especially in time of war) will run very high, sometimes 30 or 40 per cent., and, although it happens at the time that the subscription is made, the ship is cast away, yet the assurers must answer the loss to the insured. *But if the party that caused the insurance to be made saw the ship wrecked, or had certain intelligence*, such subscription *will not oblige the same, being accounted mere fraud.* So, likewise, if the assured *having a rotten vessel, shall assure upon the same more than she is worth, and afterwards give orders, that, going out of port she should be sunk or wrecked, this will be fraudulent and not oblige the assurers to answer.* So soon as you hear of a certain that a loss has happened, you must inquire at the office for the insurers (if you know them not) and acquaint them of the loss, and how you came to know it, and desire them to inform themselves of the truth of it if they please, and are not satisfied with your report. When they are satisfied there is a real loss, there is generally an abatement of 10 *per cent.* for prompt payment; for if they are punctual men, and value their reputations, they will presently pay you; if not, they will shuffle you off, and endeavour to find out flaws, and raise scruples for a larger abatement than ordinary, and sometimes will keep you a year or two out of your money, and, many times, never pay; *but generally get in case of loss* 15 *or* 20 *per cent.* abated; I have known 40 per cent. abated on very small pretensions, which makes a common proverb about such insurers:—*What is it worth to insure the assurers?* Be careful,

* In Marine Insurance, sometimes four or five persons called "underwriters" take the risks upon themselves, sometimes only one, but at other times 20 or 30.

therefore, to deal with honest men that value their reputation, when you have anything to be insured!" This advice of the 17th century stands in equal force and virtue at the end of the nineteenth.

In 1720 a Parliamentary Committee sat to inquire into the practice of Marine Insurance as then existing; complaint having been made to the Government that "several unjustifiable projects and undertakings, whereby great mischief might accrue to the public," were being entered upon. The various petitions, counter-petitions, and affidavits presented to, and examined by, this Committee, furnish valuable evidence of the position of this class of business at the commencement of the last century. It may be noted that this was the first Parliamentary Committee on Insurance matters in this country.

The first petition examined was dated 25th January, 1719, and bore the signature of 286 merchants and traders, headed by Sir Justus Beck, of Leadenhall Street, praying for the establishment of an Incorporated Company of Insurers with a Joint Stock, and its argument avers that such a company would preserve many of his Majesty's "good subjects and their families" from that ruin to which they were exposed by being assurers in a private capacity. A counter-petition was got up by the underwriters, who were naturally alarmed at this step, signed by 375 persons, headed by Sir Gilbert Heathcote; the gist of this objection being that the establishment of a corporation would lead to undue preference, and to delay and refusal to insure when ships might be missing and in stormy weather. The British merchants also came forward with an adverse petition, urging that insurance business was in a satisfactory condition, the premiums charged in London and Bristol being lower at that time than in any other part of Europe. It was also stated that the scheme was originated simply for the purposes of stock-jobbing; and that as many families were supported by the then existing system, there was "no reason to destroy them without absolute necessity."

It was alleged by the supporters of the petition that there were *great losses by private insurers;* so much so that it had become customary (as hinted by the author just quoted) in many cases to *insure the insurers:* a precaution not unnecessary it would seem, for we have it on the authority of Adam Smith, that a list was laid before the Attorney-General of *one hundred and fifty private insurers who had failed in the course of a few years just previously to this period!* * And it was further stated that previously to that time many English merchants had insured at Hamburg for greater safety! Further still, one Robert Fletcher, a merchant, made solemn affidavit and said, "that being lately in Holland, and frequently in conversation with several merchants there, and often discoursing of a subscription then going on in London towards a fund for insuring ships and merchandise, they very much approved of the project, believing that if completed it would be a better security for the insured than any method in practice at the time."

But all this was of no avail. The Attorney- and Solicitor-General,

* *Wealth of Nations*, 5th Edit., p. 146-148.

to whom the petitions were ultimately referred, reported to the King after the following fashion:—"That the business of Insuring ships *had always been carried on as it then was; that there was no Corporation in Europe for Insuring ships;* and that the making an experiment in a thing of the sort, if it should prove amiss would be of the utmost consequence to trade. Finally, that they could not advise the erection of a Corporation *against which there were so many and great objections:* and especially the method then used being approved of both at home and abroad!"*

On what grounds the statement of the approval "at home" was based, we know not. We find a merchant writing soon after this period, "that the making of Insurance" had "vastly increased; for gamesters," he continues, "wagerers, and cunning fellows, who pretend to deal in speculation, began to be almost as much concerned as the merchant; so that a policy of insurance in a short time acquired *rather the effect of a box of dice, than a contract to secure trade;* and as gamesters seldom play fair after a few of the first games, it was not long before foul play in assurances began to appear, and which has ever since continued increasing, insomuch that it is now almost as common to hear of a wilful and fraudulent, as of an inevitable, loss at sea." It is also worthy of notice, as indicative of the period, that on the matter of these petitions being introduced in the House of Commons soon afterwards, Sir William Thompson entered into long explanations how "one Bradey" and "one Billingsley, had endeavoured to bribe him and Sir Edward Northey, not only in this but also in another undertaking called 'The Lord Onslow's Insurance.'"† Messrs. Bradey and Billingsley were the agents employed for obtaining the charters for these projects. Several years previously (1716) these *learned* gentlemen had concocted a scheme for a "public Assurance Office, with one or two millions of capital," which project also fell to the ground.

Such were the circumstances, and such the fate, of the first attempts to establish Corporations for Marine Insurance in this country. But the tables were soon to be turned. That which flattery, the bribery of officials, or the requirements of commerce, had alike failed to obtain, was still to be had at a price. *Money* was the motive power; but it must come in large force in order to take proper effect.

The various schemes which we have just passed under review had, as may be supposed, excited considerable attention in the mercantile world. Notwithstanding the learned opinions of the Attorney- and Solicitor-General to the contrary, there was a very strong feeling growing up in favour of a change from the then existing system, with its many acknowledged defects, to something better, and the plan of a corporation appeared more feasible and practicable than anything else that had been suggested. Hence we need not be surprised to find, in a very short period, a revival of the attempts in this direction.

* *Vide* Mr. Hendriks' valuable papers on the *First Parliamentary Committee on Insurance.*—*J.I.A.*, Vol. iv.

† *Vide J.I.A.*

So it was: within one year from the former defeats two fresh schemes had been organised, or rather, perhaps, two of the old ones had been reorganised, and appeared under the respective titles or cognomens of "Lord Onslow's" and "Lord Chetwynd's" Insurance projects! Their promoters immediately set to work to obtain parliamentary powers, and *how* they obtained them has been eloquently narrated by another pen:—By some inadvertence the grand committee of supply had been dismissed before provision could be made for the arrears in the Civil List. The ministers were in despair, and the Companies took advantage of the necessities of the State, *to offer the large sum of £600,000 on condition of receiving his Majesty's charter for their respective Companies.* The offer was eagerly grasped by the Ministry; and on evidence being given of the respectability of the members, of the cash lodged at the Bank to meet the losses—of their funded property—and of the amount of business transacted, Mr. Aislabie,* Chancellor of the Exchequer, presented to the House the following message—"His Majesty having received several petitions from great numbers of the most eminent merchants of the City of London, humbly praying that he would be graciously pleased to grant them his letters patent for erecting Corporations to assure ships and merchandise, *and the said merchants having offered to advance and pay a considerable sum of money for his Majesty's use, in case they may obtain letters patent accordingly;* his Majesty being of opinion that erecting two such Corporations, *exclusively only of all other Corporations and Societies for assuring of ships and merchandise, under proper restrictions and regulations, may be of great advantage and security to the trade and commerce of the Kingdom*, is willing and desirous to be strengthened by the advice and assistance of this House in matters of this nature and importance. He therefore hopes for their ready concurrence to secure and confirm the privileges his Majesty shall grant to such Corporations, and to enable him to discharge the debts of his civil government without burdening his people with any aid or supply."

Of course, "the most dutiful Commons" could not withstand such potent arguments. A Bill was ordered to be brought in; and shortly afterwards "the most dutiful, &c.," waited on his Majesty with an address of *thanks "for communicating the application for an Insurance Company,"* it being *"an act of so much condescension as deserved the highest return of duty and thankfulness!"* And so the Companies obtained their charters, and the world *Marine* Assurance Corporations.

CASUALTY ASSURANCE.

The next class of Insurance commanding notice was that for securing the ransom of persons who had occasion to travel, and who were taken prisoners or captives. "In those days," says a writer we have before quoted, "there was not merely a risk of storm or whirl-

* This man was afterwards expelled the House of Commons and committed to the Tower—not, however, we believe, in connexion with any Insurance projects.

wind. Man was more cruel than the tempest, and the galleys of the Turks were then as much feared by the masters of trading vessels as the Corsairs of the Algerine were dreaded at a latter period."

Pilgrims to the Holy Land were also accustomed to effect Insurance for their personal safety, or ransom.

This class of Insurance afterwards—if, indeed, it was ever anything else—degenerated into Insurance wagers. A traveller departing on these, or any long and dangerous voyage, deposited a specific amount in the hands of a money or Insurance broker, upon condition that if he returned he should receive double or treble the amount he had paid; but in the event of his not returning, the money placed in deposit was forfeited. The Act against Gambling Assurances proved fatal to this branch of the business. The author of "Panarithmologia" (1693), before quoted, says;

"Other Assurances are made upon goods that are sent by waggon or cart, &c., by land, from all robbers or thieves, &c. Other Assurances are made upon the lives of men and women at a rate that is moderate; for by this means, if you buy any place or office that is worth £1,000, or more or less, and you have not money enough to purchase it, you borrow £400 or £500. Now, if you die, and are not in a condition to pay this money, it is lost; but if you insure your life, then your friend that you did borrow it of, will have his money honestly paid him. *Some assurances are likewise made on the heads of men;* as if a man going for the *streights*, and, perhaps, is in some fear that he may be taken by *Moors* or *Turkish* pirates, and so made a slave, for the redemption of whom a ransom must be paid, he may (ere he goes on ship-board) go to the *Insurance Office*, and advance a *premium* accordingly upon a policy of assurance; and if he be taken into slavery in the voyage, the assurer or assurers must answer the ransom that is secured to be paid on the policy."

The risks more particularly provided for in the Casualty Insurance Offices of the present day are of an entirely different character. They relate to loss of life or limb or other personal injury by accident; to Plate Glass and Hailstone Insurance, and other casualties of a similar character with which most of our readers will be familiar.

ANNUITIES, TONTINES, &c.*

Next, after the granting of Marine and Casualty Insurances, followed the system of granting or selling ANNUITIES on lives. The first description of annuities of which we find any record are *Tontine* Annuities, so called from having been originated, or, at least, made popular by Lorenzo Tonto, or Tonti, a Neapolitan, who flourished about the middle of the seventeenth century. By some writers Tonti has been called the Father of Life Assurance. This claim can scarcely be admitted, for, although these annuities drew attention to the subject of life contingencies, and the recorded ages of the annuitants may have afforded valuable data for later observations, they were not based upon any certain data, but were entirely *speculative* in their character and intentions. The principle of these

* The Tontine principle of benefit to survivors is now applied to the bonuses only.

annuities, on Lorenzo Tonti's plan, was as follows:—A certain number of persons clubbed together a specified sum (without reference to age or sex), and at the expiration of each year the *interest* of this fund was divided amongst the subscribers *who were living*, and so on from year to year, until the last survivor received the whole of the interest.

This novel scheme had all the appearance of a profitable investment until an inquiry was instituted to ascertain what became of the principal sum subscribed after the death of the last annuitant, the interest fund only having been awarded to the subscribers. This inquiry proved fatal to the plan, for it was found that the *principal sum* was appropriated by the founders of the scheme to their own uses. When this fact was brought to light a modification of the system was attempted. A number of years was fixed for the continuation of the Tontine, and the entire amount originally subscribed was to be received by the member who last survived. This plan did not meet with general approbation. It possessed great inequalities, as many died without receiving any advantage whatever for their subscriptions, and others, longer lived, received, in many cases, nearly three hundred times the amount advanced. In 1689, the last survivor of a Tontine in France, a widow, at the period of her death at the age of 96, enjoyed an income of 73,500 livres—£3,062. 10*s.*—for her original subscription of 300 livres, of the value in British currency of only £12. 10*s.*

The system of Tontines for money gradually merged into what were afterwards known as *lotteries*, and as such were repressed by legal enactment. Even now estates are sometimes purchased, or houses erected, on the Tontine principle of all the benefits going to the *oldest survivor*, and afterwards to his or her heirs—for women are more often the members or nominees in Tontines than men. A Tontine scheme relating to some property in the neighbourhood of Perth fell in, the oldest life on the list having been that of a lady who died at Edinburgh, in 1866, aged 106. One of the nominees in this scheme, also a female, died in 1853, aged 122 years.*

The famous Tontine scheme for enlarging and improving the town of Folkestone unfortunately proved a failure, as also did that in connection with the promotion of the Alexandra Palace Company in 1871.

We must look to later times than those of which we now speak before we find the *doctrine of probabilities*—originating, first of all, in *games of chance*—so far developed and perfected as to be of any real use in estimating the chances, or *expectation* of life. Without some such guide it is scarcely to be supposed that any number of persons would seek either to sell or to purchase annuities, otherwise than as occasional speculations. The uncertainty would be so great that only the most wary or dishonest would succeed. This, indeed, seems to have been the case, for the annals of that period teem with records of the doings of one AUDLEY, who, although originally only a poor

* Mary Benton:—her portrait was published in the *Illustrated London News*, about a year before her death.

clerk with six shillings a week, was "so neat an adept in the tricks of law," and so keen in his annuity dealings, which chiefly consisted in purchasing annuities well secured upon property, that he became one of the richest men of his time. His mode of action may be best judged of by the reply made to one of his victims who accuses him of having no conscience: "We monied people must balance accounts. If you don't pay me my annuity you cheat me, if you do I cheat you." *

Passing from Audley and his class, of whom there were then, as now, too many, we come to notice a man of very different character. PASCAL, in his celebrated "Provincial Letters," had already suggested the application of the teachings of the theory of probabilities to the wants of mankind. These letters were read wherever books found their way. About this time the States-General were negotiating some life-payments, and that clever statesman, John de Witt, "added one more obligation to the many received from that distinguished man by employing the theory which Pascal suggested for the requirements of his Government." He sought for and investigated all the available data of that period, and brought his own experience and great power of mind to bear upon the subject, by which means he solved problems and laid down general principles which hold good to the present day. His report and treatise on the terms of Life Annuities was the first known production of the kind, and the lapse of two centuries has not lessened its importance in the eyes of learned and competent authorities. † From this time Life Annuities grew gradually into repute, and most Governments have used them as a means of raising money for national purposes. The formation of correct tables of mortality at later periods has done much to advance and extend the system; but, however much we may claim credit for this, we must always remember that to Holland belongs the credit of first applying mathematical calculations to political questions, and that her great statesmen were the first who, since the fall of the Roman Empire, had attempted to fix the rate of annuities according to the probabilities of life.

FIRE INSURANCE.

About the period to which we have now arrived, attention was beginning to be directed to the subject of FIRE INSURANCE. It is true, as we have seen, that in the early Saxon Guilds, loss by fire was one of the calamities provided against; but the compensation so provided must necessarily have fallen very far short of that required in an increasing commercial community. It appears also that *superstition* had some share in retarding the progress of Fire Insurance, as in a later age, amongst uneducated people, it has operated against the progress of Life Assurance. Mr. Pocock found, during his

* *Francis Annals, &c.*

† *Vide J.I.A.*, Vol. ii., where the entire Treatise of De Witt has been (thanks to the ingenuity and perseverance of Mr. Hendriks) reproduced after lying hid for nearly two centuries.

researches, that "some of the very earliest proposals for insuring dwellings from fire, although they were explained and understood with a degree of sagacity and clearness far beyond the time at which they were drawn up, were almost regarded as presumptuous schemes, wherewith Providence might be tempted, and likely to excite injurious notions of the party by whom the security was offered;" and, as an instance of this feeling, he quotes the reply of Count Anthony von Oldenburgh, who, on having a scheme for Fire Insurance, presently to be noticed, submitted to him, admitted that the object of the plan was good, but considered that if he engaged in it, Providence might be tempted, his own subjects be displeased, and himself accused of avarice! But for this superstitious fear, the Germans might have claimed the credit of laying the foundation of the present system of Fire Insurance.

The scheme presented to Count Anthony Gunther von Oldenburgh, in 1609, was "for the Lords of Estates insuring the houses of their subjects against fire, by proposing to them that they should either singly or united, set a value upon their houses, *and for every one hundred dollars of valuation pay him one dollar yearly.* (For this the) landlord was to engage, that in case, by the will of God, their houses should be consumed by fire, caused otherwise than by the misfortunes of war, he should take the loss upon himself, and pay to the sufferers as much money as might be sufficient to rebuild their dwellings." The author of this design, continues Mr. Pocock, "expresses his confidence that, although the losses might at first fall heavy, a considerable sum might be thus gradually raised from year to year; and that if a calculation were to be made of the number of houses destroyed by fire within a certain space, the loss would not nearly amount to the money accumulated in that time. It was, however, recommended, that *not all the houses in every town should be included, as their value might prove too considerable;* but only that some certain dwellings should be received into the Association," a regulation which some of the modern offices might take a lesson from: for having a number of risks side by side has been the cause of winding up several Fire Offices of modern date.

Mr. Pocock points out, that in the preceding proposal "are the essential elements of all insurances: average of loss, and a fund provided for repayment by accumulation." Although Count Oldenburgh did not carry out this proposal, for the reasons stated, he considered that Companies of individuals might do so. We do not, however, find records of anything being done with this view until near the close of the 17th century. On the 15th day of October, 1681, it was declared by an Act of the Corporation of London, that an Insurance fund should be formed under the direction of a committee, to meet at Guildhall every day, from three to six o'clock, for perfecting "the same undertaking to the good satisfaction of all persons, both citizens and others, that have or shall have any interest in any building there." On the 16th of the ensuing November it was agreed, at a Court of Common Council, "that books should be prepared by the

1st December following, and lodged in the chamber of London, for receiving and entering subscriptions; and that lands and ground-rents to the value of £100,000, should be forthwith settled as a fund to insure such houses as should be subscribed for. Also, that thereafter, as subscriptions should be made, a further additional fund, by the premiums which should be received, should be made. *The premium for insuring brick houses to be £4 per cent., and for timber houses £8 per cent.* But this (adds the Rev. John Strype, who was contemporaneous with the design) would not take, perhaps because the credit of the City at this time was but low."

The *first* Fire Insurance Office which actually transacted any business in this country was one started in 1696, under the name of "The *Amicable Contribution*," which name was very soon afterwards changed for the far more appropriate one of "The *Hand-in-Hand*."* The office was founded on the mutual principle, and by the 26th of June, 1718, had insured as many as 3,666 houses. The office is still existing, and is well managed, although its business is smaller than some of its later constituted rivals.

* The *Hand-in-Hand* celebrated its bi-centenary in 1896, and an interesting notice of its course through two centuries may be obtained from the Society.

CHAPTER II.

LIFE ASSURANCE.

HAVING traced the early history of Marine and Casualty Insurances, Annuity Schemes, and Fire Insurances, we now approach the subject more particularly identified with our present purpose, namely, the progress of LIFE ASSURANCE. The progress of other schemes of Insurance had undoubtedly prepared the way for that of Life Assurance, but still the principle grew slowly, and we require to carry back our historical jottings to an early period, in order to discover where and when the seeds first germinated.

We have already disclaimed the intention of disputing with the nations of antiquity the merits of originating the theory of Life Assurance. This, however, is not to prejudice our right to inquire in how far they may, either directly or indirectly, have contributed to the development of the theory of probabilities, as relating to the duration of human life. It may be regarded by some as an evidence of the spirit of inquiry; by others as an incident scarcely worth the remarking, that Pliny, in his well-known observations on the census of Vespasian, and the enumeration of the inhabitants of the country between the Apennines and the Po, takes especial care to distinguish the number of persons living at ages above 100; or as a coincidence worthy of little note, that Plato remarked to the effect "that many persons had lived to a great age by reason of the serenity of the air, and the almost continuous summer prevailing in Egypt and Syria." But when we find a later writer (Eusebius) remarking that "the *experience* of a long series had led to the examination of the facts which had thus been handed down to his time with greater exactness;" and that about the time of the division of the Roman Empire, a table was actually in existence by which annuities could be valued, matters assume a different aspect.* But passing by this part of the subject it will serve our present purpose better to confine our remarks to the progress of Life Assurance in England.

The first *parish registers* were kept in England in 1538. They had been kept long previously in Augsburg and Breslau, though it was not till the beginning of the seventeenth century that they were general in Europe. "It is worth mentioning," says Mr. Francis, "that long ere this, the Paternal Government of Peru kept a register of all births and deaths throughout the country; exact returns of the

* For further investigation into these and similar points, see *J.I.A.*, ii.—Hendriks Papers; also Dr. Ogle's Paper in the *Journal of the Royal Statistical Society*, lv., 437.

population being made every year by officers appointed by the State." Or look still further back, and we find the Romans, from the time of Servius Tullius downwards, "took a census every fifth year; and the right of citizenship was involved in anyone failing to comply with the requirements of his age, name, residence, the age of his wife, the number of his children, slaves and cattle, together with the value of his property." But as they do not seem to have kept any register of burials, it is probable that the chief object of the census was to raise money for the purpose of conquest. Even in England, neither the age nor the cause of death was inserted in the early parish registers. By degrees, this second deficiency became supplied, but it was not till 1728, or nearly two centuries after their first adoption, that the *ages* of the dead were introduced. "John Smart, of Guildhall, London, Gent.," in the 2nd edition of his admirable Tables of Interest, Discount, Annuities, &c., published in 1726, suggested that the parish clerks should make a return of the age of every person dying; and his recommendation had the desired effect. Towards the close of the sixteenth century the frightful ravages of the plague had caused such alarm in the country, that to "quiet public feeling" the Government of the day wisely thought it desirable to publish correct accounts of the progress of the pestilence. These were called "Bills of Mortality," and "though they were not at first maintained consecutively, they were afterwards found so useful as to be continued from 29th December, 1603, to the present time."

The next step in progression was the publication, in the early part of the seventeenth century, of "the first English work on the subject," entitled "Natural and Political Observations on the Bills of Mortality," of which the author was Captain John Graunt, born in "Birching Lane." This has been described as "the earliest movement in economical arithmetic, and the closest approximation to the data on which Life Assurance is founded." His attention appears to have been first drawn to the Bills of Mortality by hearing "men of great experience in this city talk seldom under millions of people to be in London." He found the actual number of inhabitants to be about 384,000. It seems he made enemies by his book, as others have done who fearlessly aimed at the truth; for when the Great Fire of London occurred, "he was accused of having gone to the reservoir of the New River Company, and of cutting off the supply of water!" *

Many of the observations contained in this book of Graunt's, are as curious for their accuracy as for their originality. In one place he says, "seven out of every 100 live in England to the age of 70." This was probably not far from the truth at that time. Dr. Price found, a century afterwards, that in the town of Northampton, the number was ten. The Carlisle Tables show 24 as the number. Again, he says in his own quaint way, "the more sickly the years are, the less fruitful of children they be;" and although the idea was then ridiculed, it has since been found perfectly true! He laid it down that there were good reasons "why the magistrate should himself

* Francis.

take notice of the number of burials and christenings." The reasons he assigned, however, were hardly of equal importance with the suggestion; one of them being to ascertain whether the City of London had "grown big enough." Graunt was by no means the only writer of his period who entertained grave apprehensions on the subject of the growth of London. His contemporary, Sir William Petty, who did much to direct public attention towards mortality observations, published an Essay on "Political arithmetic, concerning the growth of the City of London, with the measures, periods, causes, and consequences thereof." The fears then attained were rather of a political than of a sanitary character; thus, a statute passed in the reign of Elizabeth declares "that such multitudes could hardly be governed by ordinary justice to serve God, and obey her Majesty." Sanitary considerations were not, however, entirely overlooked, for another statute of that period lays it down that "such great multitudes of people in small rooms, being heaped up together, and, in a sort, smothered with many families of children and servants, in one tenement, it must needs follow, if any plague or any universal sickness come among them, it would presently spread through the whole City." Yet, in 1581, a proclamation was issued *forbidding any new buildings.*

It is worthy of note that, at this period, the present order of population appears to have been reversed; and that there were, then, more males than females living. In speaking of a peculiar disease or epidemic which had arisen, Graunt says, "for since the world believes that marriage cures it, it may seem, indeed, a shame that any maid should die unmarried, when there are *more males than females*; that is, an overplus of husbands for all that can be wives!"

These speculations, although curious from their originality, and frequently remarkable for their truth, were still far too unconnected and indefinite to form a correct basis for the operations of Life Assurance. Still they did much to call public and scientific attention to the question of life contingencies; and it is more than probable that Dr. Halley, the Astronomer Royal of that day, was amongst the number whose attention was so drawn. It is certain that it was about this period that he commenced a series of observations, which resulted in the publication, in 1693, of the *Breslau Table* of Mortality, and which, in addition to rendering his own name immortal, was the first important step towards raising the Doctrine of Life Assurance to a position to claim rank amongst the sciences.

It is not a little strange that while England was the theatre destined for the correct development of Life Assurance, she could not of herself furnish the data upon which its practice was to be built. The omission, before referred to, of leaving the ages unrecorded in the early parish registers of burials, caused Dr. Halley to have recourse to the registers of the town of Breslau, in Silesia, which was the only place where a record of the ages of the dead was kept. From the recorded ages in the Breslau register, Dr. Halley drew a table of the probabilities of the duration of human life at every age. In it he

taught with great clearness and exactness the conditions needful for the formation of rates of mortality; the manner of forming them with complete geometrical precision; of deducing a corresponding table of the present state and annual movement of the population; of reading in them the probability of survivorship of any person taken at random in a given society; of, in truth, concluding upon the probable duration of the co-existence of several individuals from the sole knowledge of their age. He, also, first developed the true method of calculating Life Annuities, taking for his guide the rate of mortality during five successive years in Breslau.*

It will not fail to strike the reader, as we proceed, as at least strange, if not altogether unaccountable, that the results of Halley's labours did not give some immediate impetus to the business of Life Contingencies. Such, however, certainly does not appear to have been the case. The publication of his Tables (in the *Philosophical Transactions* for the year 1693, No. 196), seems to have created as little attention in this country as did De Witt's Treatise on the continent, although there is great reason to believe the latter was purposely suppressed. Dr. Gouraud, in his *History of the Calculus of Probabilities*, published in Paris, in 1848, an able work, after speaking of De Witt and his works in terms of admiration, adds "and again, when in 1693, an English mathematician of the highest order, proceeding in turn to study, in the obituary returns of London and Breslau, the general laws of human mortality, published on this subject a Memoir, which is read even to this day with admiration, absolutely no one took any heed of it. . . . Useless instructions! Buried in the vast and rich collection of memoirs of the Royal Society of London, the admirable labours of Halley were only to be discovered there by posterity." But so it was.

How to account for this neglect is very difficult, particularly at a period when public curiosity had been excited by the failure of various annuity schemes,† and when one would therefore have supposed that anything which bore the semblance of truth would have been seized upon with avidity. (Some writers have accounted for the fact by asserting that Halley's Tables being rather outlines of what mortality Tables should be than complete in themselves, no one of that day fully comprehended their use.) We think the more probable reason is, that, as these Tables were known to be based upon results chiefly obtained from abroad, they were not considered to be a correct guide to English mortality, and were therefore passed over for others less scientifically constructed at a later period. All who are acquainted with the Breslau Tables will, we think, agree with Mr. Hendriks, "that Dr. Halley was the discoverer and scientific arranger of what are termed Life Tables in the full and highly important modern acceptation of the term, and that in his paper (an estimate of the degrees of the mortality of mankind, &c.) he taught the world the best initiatory and theoretical form for the computation

* *Vide Philosophical Transactions*, Vol. xvii., p. 579; also Dr. Farr's Remarks in the Appendix to the Registrar-General's Sixth Report, p. 558.

† *Vide* Dr. Price's and Francis Baily's works on Annuities.

of Life Annuities and of Survivorships, from and to given ages." We must, however, proceed with our narrative.

The next English writer on the subject of Life Contingencies was Thomas Simpson, "a natural and self-taught mathematician, whose life, prior to throwing himself on the world of London for support, had been somewhat of a vagrant one." He is reputed to have cast rustic nativities, told fortunes, advanced courtships, and occasionally "varied his vagabondism" by undertaking to raise the devil; "an attempt in which he was so successful that he sent his pupil mad, and was obliged himself to leave the village." In 1740, he produced a volume "On the Nature and the Laws of Chance," and in 1742, this was followed by his "Doctrine of Annuities and Reversions, deduced from general and evident principles," with Tables showing the value of joint and single lives. In 1752, he made an additional contribution to the statistics of Annuities, as he published in his "Select Exercises" a supplement, wherein he gave new Tables of the values of annuities on two joint lives and on the survivor of two lives, more copious than hitherto. He first attempted to compute the value of joint lives; but as these were still taken from the London bills of mortality, they were by no means fit for general acceptance. He treated his subject, however, more broadly and clearly than it had been previously treated, giving some of the best Tables of the values of Life Annuities published during that period. Though the manner in which they might be computed had been shown by Dr. Halley, it is to the self-taught Simpson we are indebted for their practical application, as we shall presently see.

Looking a little later we find, in 1760, M. Buffon, the celebrated French naturalist, publishing "a further contribution to the statistics of Assurance, in a Table of the probabilities of life, estimated from the mortality bills of three parishes in Paris, and two country parishes in its neighbourhood." The following are illustrations of his calculations:—"By this Table," he says, "we may bet 1 to 1 that a newborn infant will live eight years; that a child of one year old will live thirty-three years more; that a child two years old will live thirty-three years and five months more; that a man of thirty will live twenty-eight years more; that a man of forty will live twenty-two years longer, and so through the other ages." He adds "the age at which the longest life is to be expected is 7, because we may lay an equal wager, or 1 to 1, that a child of that age will live forty-two years and three months longer. That at the age of twelve or thirteen we have lived a fourth part of our life, because we cannot reasonably expect to live thirty-eight or thirty-nine years longer; that in like manner, at the age of twenty-eight or twenty-nine, we have lived one-half of our life, because we have but twenty-eight years more to live; and lastly, that before fifty we have lived three-fourths of our lives, because we can live but for sixteen or seventeen years more." It is wonderful how nearly correct some of these estimates have since been found.

It is particularly noticeable that nearly all those schemes which we

now-a-days look upon and claim as resulting from the development of the science of Life Contingencies, were more or less anticipated by the early writers on the subject. Take the case of endowments for children—a good and wise provision in many cases—and we find the practice applied in a familiar manner, nearly two hundred years ago, in illustrating the practice of usury,—*vide* "*A discourse upon Usurie, by waie of dialogue and oracions, for the better varietie and more delight of all those that shall read this treatise, by Thomas Wilson,* Doctor of the Civil Lawes, one of the Maisters of his Maiesties honourable Court of Requests. Imprinted at *London* by Roger Warde, dwelling neere Holbourne Conduit, at the sign of the Talbot.—1854," wherein the writer says, "A merchant lendeth to a Corporation or Companie an hundred pound, which Corporation hath by statute a grant that whosoever lendeth such a summe of money, and hath a childe of one yeere, shall have for his childe, if the same childe doe live till he be full fifteene years of age, 500 li. (£) of money; but if the childe die before that time, the father to lose his principal for ever; whether is this merchant an usurer or no? The lawe saith, if I lend purposely for gaine, notwithstanding the peril and hazard, I am an usurer." He then illustrates the other side of the question by an Annuity problem: "A Corporation taketh a 100 li. of a man, to give him 8 in the 100 li. during his life without restitution of the principal. It is no usurie, for that here is no lending, but a sale for ever of so much rent for so much monie." In those days, when "usurie" was constituted a penal offence, such questions were not infrequently arising.

Our remarks have hitherto been confined chiefly to English writers and mathematicians; but the mere mention of the name of Buffon opens up associations of a brilliant array of continental writers—many of them contemporary with him—who have contributed in no small degree to the development of the science of Life probabilities. For the reader's further acquaintance with them we will refer him to one of the most excellent papers ever penned on such a subject, an article *On the Origin and Progress of the Calculus of Probabilities*, by the late Samuel Brown, Actuary of the *Guardian* Assurance Company (*J.I.A.*, vol. vi.)

We have spoken of Pascal and De Witt. With the name of the former is connected that of the Chevalier de Mere, by whom Pascal was furnished with a couple of problems for solution connected with the *laws* of chance in the throw of dice; which solution was afterwards generalised by Fermat. A few years afterwards Huyghens, a celebrated mathematician, published a work in Dutch, containing several curious problems of a like nature. But as no immediate application was made of them to Life Contingencies, we must return to the grand pensionary, De Witt. "In 1761," says Mr. Brown, "this great man, celebrated alike as a statesman and mathematician of the highest repute, who had already published, in 1650, a work on curves, to which Condorcet refers in terms of eulogy, conceived the design of applying the doctrine of probabilities to the valuation of human life in the question of Government Annuities. Collecting the registers of

births and deaths in various towns in Holland, he used the results to estimate the true value of a Life Annuity, in the report which he prepared on the resolution of the States-General, passed 25th April, 1671, to negotiate funds on Life Annuities." This report, as we have said, has recently been brought to light by Mr. Hendriks, who remarks that "It is entitled to be considered as the first known production of any age, treating, in a formal manner, the valuation of Life Annuities."

One of the earliest applications of the theory of probabilities to moral and judicial events was by N. Bernouilli, in 1709. Taking the rules already laid down by Huyghens, he proceeded to estimate, amongst other things, *the time after which an absent person may be reputed to be dead;* the premium to be paid for assuring to a young girl a dowry or annuity on the day of her marriage; the relative value of differing testimonies; *and the comparative chances of the guilt or innocence of an accused person.* But what shall be said of a book, published a little later, by "John Craig," wherein he proposes to convince Jews, and to convert infidels by the aid of geometry and algebra!

The great work of this time, however, was undoubtedly the *ars conjectandi* of James Bernouilli, completed and published by his brother Nicholas—the N. Bernouilli of the previous paragraph—in 1713, after the death of the original author. "The views of James Bernouilli," says Mr. Brown, "were so original and profound that they took precedence of all writers of that period."

Of the continental writers of this and more recent periods we must make particular mention of Rémond de Montmort, Father Prestet, Leibnitz, Dupré de Saint-Maur, Daniel Bernouilli, D'Alambert, Euler, Lagrange, Laplace, Condorcet, and by no means least, M. Quetelet, the Royal Astronomer of Belgium; with others whom we shall have occasion to mention as we proceed,—all throwing a charm over the science with which their names have become associated. To the English writers of this period we must add Wallis, Short, Morris, Boyes, and De Moivre.

CHAPTER III.

THE SUBJECT DIVIDED INTO DISTINCTIVE PERIODS.

HAVING traced the progress of Life Assurance through the period of its early development, we have now to note its progression during the period which has brought it into active practical application. The most intelligible way of doing this will be to mark the several epochs of progression under their characteristic heads. Thus, our First Division will commence in 1698, and terminate in 1760; it will be called the period of "Speculative Assurances." The next Division will commence in 1762, and terminate in 1815; this will be called the "Transition Period." The Third Division will commence in 1816, and terminate in 1844; this will be called "The Golden Age of Assurance Companies." The Fourth Division commences in 1844, and is called "The Period of Bubble Companies." The Fifth Period commences in 1862, and continues to 1870. The Sixth Period commences with the passing of "The Life Assurance Companies Act, 1870," and continues to the present time. The reasons for these divisions of the subject, and the titles by which they are severally designated, will be more particularly set forth as we proceed.

FIRST PERIOD—1698 TO 1760.

"SPECULATIVE ASSURANCES."

Although the *Amicable* Society is generally considered to have been the earliest English Office for granting Assurances, we have records of the existence of at least two schemes of a similar character prior to it, which deserve a passing notice. The first was projected by the Rev. William Assheton, D.D., Rector of Middleton in Lancashire, "for the benefit of the widows of clergymen and others, and for settling of jointures and annuities." The design was undertaken by the Mercers' Company, in London, which, in 1698, settled the sum of £2,888 per annum, as a security for the yearly payment of £30, during the life of any widow whose husband had, in his health, subscribed £100 to the fund, which was the limit allowed. Married men under 40 might not subscribe more than £500, or under 60 more than £300. The scheme, however, did not succeed. In 1699, another similar institution was formed, under the name of "The Society of Assurances for Widows and Orphans," which has, also, long since passed away. Each of these Societies did a large business, and their downfall may be traced to the existence of no correct data to guide them in their operations.

A lapse of seven years from the last date brings us to *The Amicable Society for a Perpetual Assurance Office*, as it was then called, founded 1706, and united with the *Norwich Union* in 1866; and fourteen more years place upon the stage the *Royal Exchange* and *London Assurance Corporation.* The events attending the formation of these Companies will be more fully reviewed at the commencement of our next chapter.

The periods intervening between the establishment of the Offices just named produced swarms of other Insurance schemes under almost every conceivable title. Thus, in the next year after the establishment of the *Amicable*, Charles Povey projected a Company to be formed in Hatton Garden, for four thousand healthy persons between the ages of 6 and 55, under the name of "The Proprietors of the Traders' Exchange House." Every subscriber was to pay *2s. 6d.* per quarter, for which premium three hundred pounds was to be *equally distributed* to the nominees of the assured persons dying in any quarter, with one halfpenny from the clear profits of *the printed papers sold by the Office:* about which more will be said presently. Soon afterwards, we find this same Povey, who had rendered himself conspicuous as the author of a publication entitled "The unhappiness of England as to trade," projected the *Sun* Fire Office, and *sold it* to certain purchasers, who, under a settlement in April, 1710, constituted themselves into a Company. In addition to his endeavours to remove the evil consequences resulting from fires, he invented a machine to extinguish them, long known as "Povey's Fire Annihilator." About this period "The York Buildings Company" and "The English Copper Company" were also started; and other Societies were formed "for the purpose of assuring the lives of particular classes of persons, as members of the army and navy, clergymen, schoolmasters, &c."*

About this date, also, commenced a system of speculative assurances known as the "little goes." A number of persons combined, and each subscribed 5*s.* fortnightly, inclusive of policy stamps and entrance money, on condition of £200 being paid to his heirs and executors. In another of these schemes 5*s.* a quarter entitled the subscriber's representatives to receive £120 on his demise; while a third, called the "Fortunate" Office, was to provide marriage portions of £200 for those who paid 2*s.* per quarter. One of these "little goes" was held at the Cross Keys, in Wych Street; another, called the "British Apollo," in Rolls Court, Fleet Street; and a third in Petticoat Lane. These were for the most part swindles, but a chronicler of the time says—"The success of these schemes sharpened the invention of the thrifty, and immediately almost every street in London abounded with Insurance Offices, where policies for infants, three months old, might be obtained for short periods. From these they diverged into other ages, and various descriptions of persons."

At this period a custom existed with the Insurance Offices of printing historical or political papers, in the form of newspapers,

* Pocock, p. 95.

which will explain a promise made by "The Proprietors of the Traders' Exchange House" scheme, that every member was to have a halfpenny from the clear profits of the papers sold by the Office. Hatton, the old London Historian, speaking of the *Union* Fire Office, established in 1714, says, "every subscriber, desiring the same, may have one of the printed papers they publish once or twice a week gratis." A publication of the same kind was, also, issued by the *Sun* Fire Office, in 1724, called *The Historical Register*, which was presented to the Insurers as a newspaper. It was continued until 1743, having been first published weekly, and then quarterly, when each Register consisted of a thick octave pamphlet, sold to the public at one shilling.* These publications have proved a valuable addition to our historic literature, and were most likely conducted at a far less expense than many of the Offices now go to annually in advertising.

A notable point of comparison between the Assurance Offices of this period and those of modern times, is the situations selected for carrying on business. The modern Offices rival each other in the splendour of their buildings, and the prominence of their situation. In the "good old times" the *Sun* took up its abode at the "back of the *Royal Exchange*." *The Royal Exchange* Office did business *against the Exchange*, on Cornhill; also "at the Rainbow Coffee-house, by the Inner Temple Gate, in Fleet Street." The great *Equitable* held its first meeting at the "White Lion in Cornhill." A Fire Insurance Company, with a capital of two millions, was held at the Three Tuns, Swithin's Alley; an Annuity Society at the Rainbow, Cornhill; another Fire Company at the Swan and Rummer; an Assurance Office "for Horses dying natural deaths, stolen, or disabled," very properly, at (the Crown Tavern) Smithfield. Another Assurance Office "for all masters and mistresses against losses they shall sustain by servants, thefts, &c., 3000 shares at £1000," at the *Devil* Tavern! and a "new Assurance Office upon the lives of men, women, and children," at the Bell and Dragon, otherwise called Lincoln's Inn Eating House, in Portugal Street, at Lincoln's Inn Back gate!†

It was during the period of which we are speaking, that most of the Companies referred to at the commencement of this Chapter were formed. David Macpherson, in his *Annals of Commerce*, says that out of above two hundred visionary schemes that were formed and carried into effect at that time only four existed at the time he wrote, and two of those have since passed away. A little later, another historian tells us that "The *Laudable Society*, the *Amicable Society of Annuitants*, the *Provident Society*, the *London Annuity Society*, the *Equitable Society of Annuitants*, the *Westminster Union Society*, the *London Union Society*, the *Consolidated Union Society*, the *Public Annuitant Society*, the *Rational Society*, the *Friendly Society of Annuitants*, and others (whose names are now lost or forgotten) *were all established about the years* 1770 *and* 1771." But that which strikes

* Pocock, p. 96.

† For numerous other similar examples, see *Pocock on Life Assurance*, and *Francis' Annals of Life Assurance*, &c

the historical reader as one of the most remarkable features of the times, is the *purposes* for which many of the so-called Assurance Offices were got up. Here we find "A Mutual Assurance Company was formed to aid an adventurer with funds to raise a vessel which, laden with the treasures of the East, had been lost on her passage home; the peculiar feature of the transaction being that, if any of the association should die before the object was accomplished, their share was to be transferred to the remaining adventurers." This made the hazard a double one. Another Company, having at its head three English peers, two bishops, four Irish peers, with many eminent merchants and gentlemen," petitioned the King that it might be incorporated *for purchasing and improving forfeited and other estates in Great Britain*, for granting annuities, and for insuring lives; seeing this will (were the words of the petition) unite by interest many of the King's subjects against the Pretender and his adherents for ever. In order to which several of the petitioners have sent persons into Scotland for purchasing the forfeited estates there, *and have since by voluntary subscription to the Governor and Company of Undertakers for raising the Thames Water in York Buildings* raised a Joint Stock of £1,200,000, on the credit of which estates they propose to grant annuities for and to insure on lives; for the benefit of such of his Majesty's subjects as are straitened in their fortunes by the reduction of interest." This scheme seems as unintelligible as it is voluminous. The further we look back the more daring and unaccountable are some of the schemes proposed. As early as the middle of the 17th century, Assurance Companies were resorted to for carrying into effect any ingenious or costly project, when all other means had failed. Thus, in 1643, one, Captain John Bulmer, an unsuccessful engineer, published a scheme entitled "*Propositions in the Office of Assurance, London, for the blowing up of a boat and a man over London Bridge.*" In this paper the projector covenants for himself, his heirs, &c., to perform the undertaking within a month after intimating from the office he was ready, "so soon as the undertakers wagering against him 6 for 1," should have deposited enough to pay the expenses of making the boat and engine, he also subscribing his own proportion. The money so collected was to remain in the office until Captain Bulmer had either performed his contract, when he was to receive it all, or till he had failed, when it was to be repaid to the subscribers; 'and all those," adds the paper of propositions, "that will bring their monies into the office shall there be assured of the loss or gain, according to the conditions above mentioned."* A hundred other schemes, equally absurd and unproductive of any good, were brought forward, some meeting with good success, while the new and respectable Companies made but slow progress; "Onslow's Insurance" (as the *Royal Exchange* was called), and "Chetwynd's Bubble" (the title given to the *London*), being hawked in 'Change Alley, along with Companies for "importing jack-asses" and "fatting hogs."†

* Pocock, pp. 88, 90.
† *Francis' Annals*, p. 79.

But the distinguishing feature of the age was the "Gambling" tendency of nearly all the Offices. Under the title of "Insurance Wagers," every conceivable description of speculation was entered into. On one day we find the Offices wagering £30 against £100 that King William could not reduce the City of Namur before a given date.* The next, on the period of favour to be enjoyed by the mistresses of some foreign potentate. And the third day, on the *sex* of the Chevalier D'Eon, whether he was a *male*, as he pretended to be, or a *female* as he was reputed to be.† The duration of the lives of persons believed to be on their death-bed, was a common hazard; and the author of "Every Man his own Brother," was not far wrong when he said the dissolution of persons, who saw themselves insured in the public papers at 90 per cent., was, not unlikely, hastened by such announcements.

Even the morality of the newspapers of that day was shocked by such proceedings: we find the *London Chronicle* of 1768 thus declaiming, "The introduction and amazing progress of illicit gaming at Lloyd's Coffee-house is, among others, a powerful and very melancholy proof of the degeneracy of the time. Though gaming in any degree is perverting the original and useful design of that Coffee-house, *it may in some measure be excusable to speculate on the following subjects:*—Mr. Wilkes being elected member for London; *which was done from* 5 *to* 50 *guineas per cent.;*—Mr. Wilkes being elected member for Middlesex, from 20 to 70 guineas per cent.; Alderman Bond's life *for one year*, now doing at 7 per cent.;—On Sir J. H. [mark the modesty!] being turned out in one year, now doing at 12 guineas per cent.;—On John Wilkes' life *for one year*, now doing at five per cent. *N.B.—Warranted to remain in prison during that period;*—On a declaration of war with France or Spain in one year, 8 guineas per cent. But," continues the sensitive journalist, "when policies come to be opened on two of the first peers in Britain *losing their heads at* 10*s.* 6*d. per cent.*, or on the dissolution of the present parliament within one year at 5 guineas per cent., which are now actually doing, and underwritten *chiefly by Scotsmen*, at the above Coffee-house, *it is surely high time to interfere.*"

In the *Public Advertiser*, of Dec. 6, 1771 (then the leading newspaper), we find the following paragraph:—"We have the pleasure to assure the public, from the most undoubted authority, that the repeated accounts of her Royal Highness the Princess Dowager of Wales being very ill, and her life in great danger, are entirely false; *such reports being only calculated to promote the shameful spirit of gambling by insurance on lives!*" Contrast this state of things with the Assurance contracts of modern date, and see how in this, as in other matters, the times have changed.

* William III. was, at this time, carrying on a war with France.

† This extraordinary personage, who had been acting in a diplomatic capacity in several countries, and who was for some time in London as a minister plenipotentiary from France, was proved upon a trial held in the King's Bench, in *an action to recover wagers as to his sex*, to be a *woman*, July 1, 1777. He subsequently wore female attire for many years; yet, at his death in London, in 1810, it was manifest, by the dissection of his body, and other undoubted evidence, that he was of the male sex.—*Biog. Dict.*

The reason of the change may be best gathered by the perusal of the following provisions of an Act of Parliament passed in the 14th year of George III., not very long after the period of which we have been speaking, which Act is generally known as the "Gambling Act."

It enacts that no Insurance shall be made on the life of any person, or on any event whatsoever, where the person on whose account it shall be made *shall have no interest*, or by way of *gaming or wagering;* and that every such Insurance shall be null and void. It further provides that it shall not be lawful to make any policy on the life of any person, or on any other event, without inserting in the policy the name of the person interested therein, or for what use, or on whose account such policy is so made; and where the insured has an interest in such life or event, no greater sum shall be received from the insurer *than the amount of the interest of the insured in such life or event.* Thus ended, at one blow, the period of "Gambling Insurances."

It comes strictly within our scope (as will be hereafter seen) to notice the attention which, about this period, was beginning to be paid to the question of *interest* and arithmetic. Several most interesting works were written thereon, but we have only space to glance at their title-pages, and one or two of their other peculiarities.

Leybourn's *Panarithmologia*, for example, refers to the subject as follows:—

"For the second part, which consists of simple interest and rebate at several rates and times, they are already in every man's hands; and for tables of compound interest at several rates and times (for one pound only) are no new things."

Another book, published in 1728, has an extremely prolix title commencing:—

"An Estimate of Places for Life; shewing how many years' purchase a place for life is worth; how long a man must hold his place to have the value, principal, and interest of the purchase-money; how much he has coming in per cent. per annum for his money; what a place for life is worth, the income not exceeding £1,000 per annum; all at one view, &c., &c. By Richard Hayes, Teacher of Merchants' Accounts, in Great Eastcheap."

As early, too, as 1608, a book was published by Robert Norton from the Flemish of Stevinus, under the title of "Disme: the Art of Tenths; or Decimal Arithmetic."

CHAPTER IV.

SECOND PERIOD—1762 to 1815.
"TRANSITION PERIOD."

THE year 1762 ushered into existence the *Equitable* Society, and with it a new era in the *practice* of Life Assurance. Notwithstanding the brilliant array of names we have already seen associated with the development of the *science*, we cannot escape from the fact that the *practice* had hitherto been left to a blind-fold progression: that *chance* reigned supreme where all things should have been *fixed* and *certain* and that the improvements which from time to time crept in were rather the result of accident than design. If we want instances, we need not travel far for them. Dr. Halley, as we have seen, had completed his Breslau Table of observations before the close of the 17th century; and, indeed, made great progress with his calculations of the value of Life Annuities at particular ages, yet, in a Money Act passed in 1694, a single life was estimated at seven years' purchase only, two lives at eight and a-half years, and three lives at ten years' purchase. In another Act, passed nine years later (1703), these values were but slightly revised, a single life being increased to nine years' purchase, two lives to eleven years, and three to twelve years' purchase. But at the same period, and still more unaccountably, the owner of a *life* annuity might change it for an annuity for ninety-nine years on payment of four and a-half years' extra purchase—making the entire consideration money only thirteen and a-half years' purchase. Or, putting it more intelligibly for the general reader, an annuity of £50 could then be secured for the period of ninety-nine years by paying down the sum of £675, while the table *now* shows the value of such an annuity to be about £1,500, or considerably more than double. No difference in the rates of interest or value of money can reconcile or explain away such discrepancies!*

Again, we smile with astonishment at the high rates of premium charged by the early offices, but it has been remarked—and the assertion may challenge contradiction—that for all that was then actually known those rates might as well have been *too little by half*, as they turned out to be *too much by half*? *Five pounds* was the premium

* In reference to the annuity schemes of this period, Dr. Farr says, "The Life Annuity at seven years' purchase was by far the best bargain; for the interest of money being 6 per cent. the Life Annuity was worth, at Halley's estimate, thirteen years' purchase (13'4 at the age of ten), and an annuity for thirty-six years was worth only sixteen and three-quarter years' purchase. The value of a Life Annuity of £100 was £1,300, which was obtained for £714; and the *new* offer to such a purchaser was, if he would advance £450 more he should obtain an annuity worth £1,660; by accepting the offer, he would have gained £496 on £1,164; *by rejecting it his profit was* £586 on £714."

originally demanded to assure £100 *for one year*, on a life of any age between twelve and forty-five! On the 25th day of November, 1721, the *London Assurance Corporation* granted an assurance to Mr. Thomas Baldwin on the life of Nicholas Browne for £100. In this case £5. 5*s*. was the premium for twelve months, and this rate is known to have been continued for some time. The *Amicable* Office charged an entry fee of £3. 15*s*. per cent. in addition to £5 premium; and middle-aged and old lives were frequently rejected even on these terms.* Mr. Babbage endeavoured to discover the circumstances which led to the fixing of 5 per cent. premiums, and came to the conclusion that it probably arose from its appearing that the annual number of deaths in London *was nearly one in twenty of the population.* But he naturally enough remarks that it must soon have occurred to anyone who wished to have recourse to such transactions, that the chance of a person aged twenty, dying within any given period, could not have been so great as that of a person of forty dying within the same period.

In addition to the premiums named, extra rates were demanded for "youth hazard," "female hazard," and "occupation hazard:" while "officers on half-pay," and persons "licensed to retail beer," were charged no less than 11 per cent. extra. Nor did the Offices, with the exception of the *Amicable*, make any return of profits to the assurers, and in this Office the divisions took place without much regard to equity. The sum considered to be profit was divided every year *amongst the policies which became claims during the year*, quite irrespective of the time such policy had been in existence; and the Society had no power of applying any portion of such profits for the benefit of the assurer during his lifetime. Such was the position of assurance business just prior to the time we are now entering upon! Need we wonder that Life Assurance was slow in becoming popular?

It is, we have no doubt, perfectly true that the Offices acted up to the principles of their constitution; but if this be admitted it only rivets us to the fact that the practice had by no means kept pace with the science. That the Offices established prior to the *Equitable* paid very little regard to the cultivation of Life business we have abundant proof. Professor De Morgan has remarked of the *Amicable* that it was "originally founded rather on principles of mutual benevolence than of mutual assurance, as now understood." And the account which the managers of the Society gave of its constitution, when opposing some new schemes in 1720, coincides with this view. They affirmed that they were a Corporation created by letters patent, 5° *Annæ Reginæ*, which did constitute a number of persons, not exceeding 2,000, to be a body politic, with power to purchase lands not exceeding the yearly value of £2,000; and to raise a joint-stock for the use and relief of widows and orphans, in the manner and under the regulations therein mentioned. And that the members of the

* The original Charter of the *Amicable* stipulates for the payment by members of £6. 4*s*. per annum, by quarterly or monthly instalments. Subsequent "By-laws of the Corporation," dated 19th January, 1737, confirm this payment, and limit the ages of members to the above.

Corporation did begin to act under their said charter in the year 1706, and had continued to act ever since; had admitted members, *granted policies on lives* and improved their joint-stock at interest on Government securities and otherwise, which then amounted to £50,000 or thereabouts; and that they had made *annual dividends* to the claimants of the members who had died in each year, according to the directions of the charter. That in the year 1710, and ever since, they had divided £10,000 per annum amongst the claimants; and what appeared most important for their present purpose, in the year 1707 or 1708, several persons endeavoured to get another charter for insurance on lives, *but that the same was stopped* at the Great Seal, on hearing counsel for the said *Amicable Society for a Perpetual Assurance Office.**

The *Royal Exchange* and *London Assurance Corporation* were established next after the *Amicable;* and they were the first Offices that issued life policies for fixed sums payable at death: the latter Office issued its first life policy on the 7th June, 1721. Yet, strange as it may appear, in the charter obtained by these Companies in 1720, not a single word was said on the subject of Life Assurance, nor in the preliminary Act of Parliament passed in the previous year—an Act "for the better securing certain powers and privileges *intended to be granted* by his Majesty by two charters for assurance of *ships and merchandise*, and *for lending money upon bottomry;* and for restraining several extravagant and unwarrantable practices therein mentioned." This was the Act passed by "the most dutiful Commons" on an occasion we have already noted. But within twelve months from the period the original charter was obtained these corporations were again before the "House." Fortune had not smiled favourably upon them. They had invested some portion—some considerable portion it has been said—of their funds in the "South-Sea" project, and the bubble had burst. They were, therefore, unable to perform, in full, the pecuniary engagements under which their charter had been secured; and they sought, and obtained, from Parliament some modification of these conditions.

It was under their amended or modified charter that these Companies obtained powers for assurance of lives. What had so suddenly moved them to take up this branch of business it is difficult to say; unless the following circumstance should offer any solution. Just previous to this date, a petition had been presented to Parliament, signed by Sir James Hallett, and 113 other merchants, &c., subscribers to a "Fund of £1,200,000 for granting annuities, securing fortunes to widows, orphans, and others; settling jointures on marriages, and insuring of lives, &c." The petition first spoke of the advantages of annuities; and then proceeded to point out that it would be of great advantage to the subjects of these realms, "especially such of them as are in trade, to use in such their trade the greatest part of the fortunes they may receive with their wives; and which they might much the better do, could they, by laying out some part of the said fortunes, receive a sufficient competency for their wives to live and subsist upon, in case

* *Vide* Mr. Hendriks' Papers, *J. I. A.*, iv.

they should, by the chance and hazard of trade, either fail or die, without a capacity to make any other provision for them." Further, "that it would also be very serviceable to his Majesty's subjects could they safely and securely insure upon their lives; which would encourage merchants to be more bold in their undertakings, because in case of their death before their schemes in trade succeed, their widows and families might thereby receive a benefit in a great measure to recompense the failure of such their undertakings. That persons in good offices and employments for life may, for the same reason, be induced to make provision for their families, who during their lives have an opportunity of maintaining them in good credit, but at their death very often leave them in slender circumstances."

These arguments might be multiplied, but they could not be much improved upon. The Attorney-General, however, in his wisdom, reported to the Government, or the King, on this—Hallett's Insurance scheme—that in his opinion it was not advisable for his Majesty to erect "any such corporation as is therein described," and the matter, so far as the then promoters were concerned, fell to the ground.

Whether it was this project or not that turned the attention of the *Royal Exchange* and *London Assurance Corporation* to *Life* Assurance, we have now no means of knowing. But we have the most undoubted proof, that while the business in *their* Marine and Fire departments was considerable, the Life business of at least one of them—the *Royal Exchange*—was most exceedingly small. How we know this the reader shall learn. When the promoters of the *Equitable*, forty years later, were applying for a charter, the *Royal Exchange* Company opposed them, taking up the ground of the *small prospect of success;* stating in confirmation that *they* had *only received for Life Assurance premiums* during the period named (forty years) the sum of £10,915 2*s.* 2*d.*! and even these, Mr. Hendriks assures us, were for what are termed short-period risks, *insured against for generally a year, or lesser period.* "Taking this element into account," he continues, "the above receipt of premium shows that the gross *sum insured* on the average of years was not more than £5,000 per annum or thereabout, being half the amount which Life Companies have now been for many years in the habit of insuring on a single life. There is (he adds) no ground for assuming that the business of the other Corporation was more extensive; in fact, although there were at this period several Associations in activity for the grant of insurances of survivorship *annuities* for widows, and of deferred *annuities* for old age; and the history of which Associations, their quarrels, competitions, and downfall, may be seen in the writings of Dale, Dr. Price, and others; nevertheless, there is no doubt that the insurance of a *sum payable at death, was, at the time we are referring to, a contract very rarely entered upon, either by the commercial or other classes of the community.*"*

This, we think, brings us very clearly to understand the position

J. I. A., Vol. iv., p. 308.

of Life Assurance, properly so-called, at the commencement of the period we have now entered upon. The confidence of the public had already been shaken (as we have seen) by numerous failures in annuity projects. The rates of premium demanded were exorbitant. The Companies of this period could not show that they had adopted any more reliable data for their guidance than their predecessors. The Legislature showed no disposition to encourage such Associations; and the only Society which at all laid itself out for the business—the *Amicable*—was so crippled by its constitution, or the provisions of its charter, as to be unable to grant assurances of the class which were then beginning to be most sought after. It has struck us with surprise that no earlier writer than Mr. Hendriks had pointed out the fact that the *Amicable* Corporation was not invested with the power of granting assurances at rates of premium calculated according to *age* until after 30th October, 1807; and it is only as recently as the 8th May, 1845, that it was empowered to grant assurances for *fixed sums*. The former of these powers was obtained by the *fourth* of its six charters, 48 Geo. III.; the latter by the 8 Vic., c. viii.

We can the more readily now understand how it was that when the before-named Thomas Simpson—the self-taught mathematician and astrologer—having raised himself to considerable literary fame by his various publications—delivered a course of lectures in London, in which he (availing himself of Dr. Halley's suggestions) announced the possibility of constructing a table of premiums *graduated* according to the age of the assured, considerable public attention was excited; and that, when the suggestions of Simpson had been investigated, and a graduated Table of Premiums actually computed by Mr. James Dodson on the plan laid down by Dr. Halley, the time had arrived for the foundation of a Society which should more completely answer the requirements of the age than any one that had preceded it. And the Society which sprung out of this combination of favourable circumstances is that which we now speak of as the OLD EQUITABLE—its original title being "*The Society for the Equitable Assurance of Lives and Survivorships.*"

Of course we all feel anxious for a glimpse at those mysterious figures—the first result of Halley's labours, Simpson's science, and Dodson's computation—and we have them at hand, merely premising, in the words of a former actuary, Mr. Morgan, that they, "in order to secure the stability of the Institution, had chosen a Table of observations, in which the probabilities of Life were so low, that the premiums of assurance derived from it were nearly twice as high as those which are required at present"—a fact most apparent from the figures themselves:—

Age.	WHOLE TERM PREMIUM.	
	Males.	Females.
14	£2 17 0	£3 3 11
20	3 9 4	3 14 3
25	3 14 0	4 1 5
30	3 18 7	4 4 4
40	4 17 9	5 4 8
49	6 2 5	6 11 0

It will be remarked that higher rates were charged for female than male lives: and whatever *theory* may say to the contrary, *practice* has confirmed the wisdom of such a course.* Nor were these pioneer actuaries wrong in putting a heavy extra percentage on licensed victuallers, as witness some of the more recent reports of the Registrar-General.

The founders of the *Equitable* were naturally anxious that it should enjoy equal legislative privileges with its predecessors. Accordingly, in 1761, a petition was presented to Parliament from the Hon. Coote Molesworth, of Chichester, Doctor in Physic and Fellow of the Royal Society; Sir Richard Glynn, Knight, Baronet and Alderman of London; Thomas Pickering, of London, D.D.; John Silvester, of London, M.D. and F.R.S., "and seventy-eight others, in behalf of themselves and many others, his Majesty's most dutiful and loyal subjects." The said petition sets forth, "That great numbers of H.M.'s subjects whose subsistence principally depends on the salaries, stipends, and other incomes payable to them during their natural lives, or on the profits arising from their several trades, occupations, labour, and industry, are very desirous of entering into a Society for assuring the lives of each other, in order to extend, after their decease, the benefit of their present incomes to their families and relations, who may otherwise be reduced to extreme poverty and distress by the premature death of their several husbands, fathers, and friends, which humane intention the petitioners humbly apprehend cannot be effectually carried into execution without H.M.'s Royal authority to incorporate them for that purpose."

To effect their "humane intention" the petitioners laid down a certain plan of operation; and concluded their petition in this wise, "That establishment, by H.M.'s Royal charter, of a free and open Office of Insurance upon the plan aforesaid, will, as the petitioners with great submission apprehend, be more equitable than any hitherto proposed as being calculated *for the sole benefit of the persons assured*, a method not hitherto practised, and will, as the petitioners humbly hope, in a variety of instances, prevent the before-mentioned inconveniences, and be productive of the greatest advantages to the public. That there is at present subsisting but one Corporation for the assurance of lives on the mutual plan, viz., the *Amicable* (the *Royal Exchange* and *London Assurance* being proprietary), which, as the petitioners humbly apprehend, acts upon so circumscribed and narrow a plan, that very few of H.M.'s subjects do receive any benefit from it, in comparison with the great number to whom the benefit of such an insurance might be extended."

Now this petition, according to the custom in such cases, was referred to the Attorney- and Solicitor-General for the time being; and their report thereon is one of the most amusing documents connected with the history of Life Assurance. These learned gentlemen remark that "1st, the petitioners propose to insure upon *cheap terms (!)*, and for a longer time than is practised at present in any Offices; to which

* As will be seen in a later chapter, it is still customary for a large number of Offices to make a slight addition to the premium for female lives. See *J.I.A.*, xxix., p. 75.

end they have specified the rates at which the assurance is to be done;" and "2nd, they propose to raise a capital by investing the premiums, together with a small additional sum of 40*s.* to be deposited by every person insured to answer all losses; and by way of further security, to oblige every person insured to become a member of the Corporation, and to declare a covenant that he will bear *his proportion upon any call if the* premium and deposits should be deficient."

The said Attorney-and Solicitor-General having considered the foregoing proposals, and also heard counsel in support of the petition, and against it, on behalf of the *London* and *Royal Exchange* Assurance Companies, and also on behalf of the "Corporation of the *Amicable* Society for the perpetual assurance of lives, in Serjeant s' Inn," all of which did their best to oppose the formation of this office; then proceed to deliver their opinions, in which may be found some very wholesome conclusions, although it is clear that they were not learned either in the theory or practice of Life Assurance: and it is more than probable that the counsel for the opposing Companies had not done much to brighten their understandings. They were "humbly of opinion to advise H.M. *not* to comply with the prayer of the said petition for the following reasons:—

"1st. Because it appears to us altogether uncertain whether this project will or can succeed in the manner in which it is proposed, and if the success is uncertain, the fund for supporting it, which is to arise from the profits of the undertaking, will be precarious. This *last* objection is, in our opinion, a fatal objection to the scheme; for, *though an undertaking plainly calculated for the benefit of the public may, in some instances, deserve encouragement, even where success is dubious, yet, in such cases, the projectors alone ought generally to abide the peril of the miscarriage.* In the present proposal, therefore, whatever else may be hazardous, the capital or fund to answer the losses ought to be certain and liable to no casualty, for which reason, when the legislature enabled H.M. to erect the two Corporations of the *Royal Exchange*, and the *London Assurance*, they thought it necessary to oblige these bodies, in the first place, to raise a large capital before they began to insure. The success (they continue) of this scheme must depend upon the truth of certain calculations taken upon Tables of life and death, whereby the *chance of mortality is attempted to be reduced to a certain standard; this is a mere speculation, never yet tried in practice, and, consequently, subject, like all other experiments, to various chances in the execution.* The Tables upon which the calculations are built are the Bills of Mortality of London and the Breslau Tables; and admitting them to be strictly accurate (*of which there is strong reason to believe the contrary*), they are compounded of diseased as well as healthy persons, of those who are embarked in dangerous as well as other employments, without pointing out the proportions they bear to each other, and yet, as the petitioners propose to insure only such even of the healthy as are not employed in dangerous occupations, *the register of life and death ought to be confined, if possible, for the sake of exactness, to such persons only as are the objects of insurance*, whereas the calculations offered embrace the chances of life in general, the healthy as well as unhealthy parts thereof, which, together with the nature of such persons' occupations, are unknown numbers.

"As the fund to answer losses (they continue) must depend principally upon the premiums (for we pay but little regard to the small deposits on the personal covenant), the project should be *sure of success*, otherwise the adventurers will be undone or greatly injured, and the project will fall the heavier because it will fall principally upon the poorest sort—the rich having no temptation to assure. *Under these circumstances if there were no other objection against the scheme proposed, the uncertainty of success would make us fearful of advising the charter.*"

But perhaps the most curious passage in the report is the following:—"We are the more apt to doubt of the event, because it has been represented to us by the affidavit of Mr. Savage, that all *profit* which has been received by the *Royal Exchange* Assurance Office, from the time of its commencement to the present time (40 years), amounts only to a sum of £2,651. 4*s*. 6*d*., the difference between £10,915. 2*s*. 2*d*. paid in premiums, and the sum of £8,263. 17*s*. 8*d*. disbursed in losses,* which small profit must have been near exhausted in the charges of management. If then, this Corporation, *who are charged with taking unreasonable premiums*, have reaped no greater profit, we can hardly expect a more considerable capital to arise from lower premiums, and the hazard of loss will be increased in proportion as the dealing will be more extensive." If these two legal personages could only now behold this great Society, with its funds of four-and-a-half millions, for the most part accumulated under a lower scale of rates than those originally proposed to be adopted, their surprise would be unbounded! But we now arrive at the second series of objections:—

2nd. The Crown has very wisely been always cautious of incorporating traders, because such bodies will either grow too great, and by overwhelming individuals become monopolies; or else, by failing, will involve thousands in the ruin attendant upon a corporate bankruptcy. And they continue: As trade seldom requires the aid of such combinations, but thrives better when left open to the free speculation of private men, such measures are not only expedient where the trade is impracticable upon any other than a Joint Stock, as was thought to be the case in the East India, South Sea, Hudson's Bay, Herring Fishery, and in some other Companies erected upon that principle; but there does not appear to be any such necessity in the present case, because the business of insuring lives is carried on, not only by the two great Companies already mentioned, *but such policies are duly underwritten by numbers of private men*,—and we think that if the profit were so enormous as the petitioners have endeavoured to represent upon the terms now, and for many years, practised in the City of London, *there would not have been wanting enterprising persons to have reduced the premiums*, and drawn this branch of dealing to themselves, by underselling the market. If the petitioners then are so sure of success, there is an easy method of making the experiment by entering into a voluntary partnership, of which there are several instances in this business of insuring; and if upon such a trial these calculations are found to stand the test of practical experiment, the petitioners will then apply with a much better grace for a charter than they can at present, whilst the scheme is built only upon *speculative calculations*.

This course was acted upon; and we are now brought to the third series of objections, which, though last, we venture to think were by no means least in their significance:—

3rd. The Parliament, in erecting the two great Companies already mentioned, have already declared their opinion that such charters ought not to be granted *without some benefit accruing to the public*, and were not sure, when they passed the Act, whether they were not *erecting a nuisance;* to prevent which, a power was reserved to the Crown to abolish the Corporation at any time within the term of 31 years, if they should be found upon trial to be mischievous or inconvenient; and we cannot help observing, that except only in the case of the *Amicable* Society of Serjeant's' Inn, and which is formed upon a *very narrow bottom*, the Crown has never of itself, as far as it appeared to us, granted such a charter as the present in any case whatsoever; *and as the two great Companies paid a very large sum to*

* These are figures referred to on p. 32.

the public for the privileges of their charter, we cannot advise the Crown to entrench upon their rights, on the bare request of any set of men, without a clearer and more certain prospect of *public good*.

And so the petition was dismissed, although "C. Pratt" and "C. Yorke"—the Attorney- and Solicitor-General—were fully persuaded that those worthy gentlemen who had made this application were really convinced that the scheme would prove advantageous to the public as well as themselves.

But the promoters were not dismayed. They saw the scheme was practicable, and resolved to carry it out. Starting upon mutual principles, they were better prepared to dispense with Parliamentary powers than Companies requiring large paid-up capital. They drew out the constitution of the Society, in the form of a Deed of Settlement; and four years afterwards, viz., in 1765—Hilary Term, 5 Geo. III.,—this Deed was duly enrolled in the Court of King's Bench. The time which had elapsed had not been mis-spent. The rates and other features of the Society had been re-considered, and in many instances improved upon. Accordingly, the examples of rates already given were not those included in the Deed. In some cases a considerable reduction had been made; but here are the amended figures, and, beside them, the rates now charged by the Society at the same ages:—

Age.	To Assure £100 for one year.	At Death.	Present rates for £100 at Death. With Profits.	Without Profits.
8	£1 10 6	£2 4 10	...	...
14	1 11 9	2 7 7	...	...
20	1 15 6	2 15 4	£2 4 6	£1 14 0
30	2 4 6	3 12 8	2 13 5	2 0 1
40	3 2 0	4 12 2	3 7 11	2 14 6
50	4 4 8	5 18 4	4 10 8	3 18 11
60	6 4 10	8 5 2	6 7 4	6 2 9
67	7 18 1	11 18 8	...	...

In each case there was a proviso against hazardous occupation; and for each girl or woman under 50, an addition was to be made to these rates.

We may take it on the authority of Mr. Hendriks, as established, "that no plan of Life Insurance, in its proper form of development as an assured provision of a fixed minimum amount of money payable at death, whenever that may occur,—the risk thus extending from the date of the Insurance being effected, up to the expiration of the whole term of life,—had been contemplated by a Company or Society, or had been considered by any Legislature in Europe, prior to the year 1760, when discussions ensued in England preliminary to the formation of the *Equitable* Society in 1762." But another consideration presents itself. The graduated scale of premiums prepared by Dodson required confirmation, either by corresponding results deduced from distinct data, or by some process of testing the soundness of the Society as it progressed in age and magnitude; for, as Mr. Morgan has well observed in one of his eloquent addresses, what signify premiums, however correctly computed, "if no means are provided for ascertaining, at proper intervals, the real state of the

Institution, and for disposing of its profits without endangering its security, either by a direct or an indirect invasion of its capital?" Happily, both these means of confirmation were at hand.

Dr. Price, "an unsuccessful Unitarian preacher, and the contributor of many rare papers to the *Philosophical Transactions*," had, amongst other things, turned his attention to the subject of Life Contingencies. For a long time he sought, in vain, for data on which to base his inquiries, but at length he found in the registers of the town of Northampton such a record of births and deaths as he considered would form a fair average of such events throughout the kingdom—and from these he constructed the far-famed NORTHAMPTON MORTALITY TABLES. The first edition of his book was published in 1771, and the fourth containing his second Table in 1783, when for the first time the Life Offices had before them what might *then* be fairly conceived to be a true guide to the expectation and duration of life in this country. But several years before the Northampton Table was completed and published, Dr. Price, who—being an uncle of Mr. Morgan, who in 1775 had been appointed actuary to the Society—had often been consulted on points of difficulty by the promoters of the *Equitable* Society, had communicated to them two plans to be employed under their existing rates—one for ascertaining, at certain periods, the amount of the surplus stock; and the other for determining, with a considerable degree of accuracy, the state of the Society's accounts each year; and so admirably were they found to answer these purposes, that they have been continued in use by this Society ever since,* and, with certain modifications, by nearly all the old Societies in the Kingdom. All honour, then, to the memory of Dr. Price!

It has been frequently said, that the history of the *Equitable* Office is the history of Life Assurance in England. If this be not literally true, it certainly is true that the readiness with which the conductors of this Office have ever listened to and embraced all real improvements, not only led it to the high position which it so speedily attained, but has tended greatly to advance both the theory and practice of Life Assurance in this Kingdom. Within one year after the publication of Dr. Price's work, he had prepared for this Society an entirely new set of Tables, embracing upwards of 20,000 calculations. The rates so calculated, although only based upon an assumed improvement of money at 3 per cent. interest, were so far below the premiums before in use, that 15 per cent. was added to them, to prevent too sudden a reduction in the annual income of the Company! In 1782, the new rates were put into practice, and we may, we think properly, mark that year as opening a new era in English Life Assurance: hence, we have named this the "transition period"—the transition being from a state of doubt, mistrust, and uncertainty, to a condition of *certainty* based upon scientific truth, and a state of confidence arising from well-merited success.

* An admirable report on the Valuations of the *Equitable* by Mr. H. W. Manly, the present Actuary of the Society, was published in 1896. The basis of Valuation was changed to the HM Table in 1900.

The effect of the new rates upon the *Equitable* Office was, even after the extra loading to which they had been subjected, to diminish the income some £4,000 in the first year. For whereas in the ordinary course of things the income would have been £36,000, it was only £32,000. This brought about some little adjustment, for "to compensate the then members for having previously contributed too much to the Society, an addition was made of 30*s.* to every £100, in respect of every payment made prior to January, 1782." To show, however, that the new rates did not at all impoverish the funds of the Society, we may note that at the time of the change the whole surplus fund only amounted to £30,000. In 1786, an investigation of the surplus took place, and the 15 per cent. increase to the rates was taken off. In 1789 a further increase was made to the sums assured, at the rate of £1 upon each £100 for every annual payment of premium made prior to 1786; and before the close of the century there was another similar addition. Even after this operation, the surplus fund was £110,000; and every person assured previously to 1772, had 30 per cent. added to the original sum mentioned in his policy.

When it came to be seen what large surpluses even the reduced rates of premium would leave in favour of the Offices, it was not much to be wondered at that a number of new Societies should spring into existence, any more than that most of them should be proprietary Companies. The business was seen to be a good one, for, with the then rates of premium, the profits were large. A *Pelican* and an *Eagle* came down to the spoil. Even the great *Globe* began to stir, and *Albion* and *Atlas* came on, with the *Sun* at their heels. From *Westminster* to the *West of England* the mania spread. *London Life* was followed by the *Norwich Union*, and another *Union* was near. The *Provident* well nigh split upon a *Rock;* and the climax of the period was a splendid *Scottish Widows' Fund!* These were days of competition with a vengeance. Two Companies—the *Royal Exchange* and the *London Assurance Corporation*—offer the Government £600,000 for charters giving them the exclusive right * of insuring ships and merchandise, and actually pay £150,000 each for the privilege. They oppose the application of the *Globe* for a charter. The *Globe* pleads the necessity of competition, and offers the Government £100,000. The money very nearly carries the point; but unexpected difficulties spring up. The *Amicable* employ counsel to oppose the formation of the "Company of Undertakers," calling them a "Company of upstarts;" the "upstarts," in reply, calling the *Amicable* "old and supine." The *Union* Life Office was held forward as being marked by "superior liberality," and having (oh, virtuous Office!) "a decided contempt of the petty advantages which swell the profits of other Offices!" The *Provincial Union* offered to take lives at 10 per cent. under the other Offices, while another Company, with "extra superior liberality," would take them at 20 per cent. less!

* This exclusive right was only against other Corporations, and not against individual assurers, who in those days were numerous.

Why, then, should we complain of the milk-and-water competition of modern times, confined as it is to "new features," and "monster advertisements!"

But, in addition to all this competition amongst themselves, the early Assurance Companies had to combat with enemies of another class. The success of some of the Offices had caused them to be a little reckless with their funds, and also a little careless of the persons to whom they granted policies. Evils were thus brought about. To the first cause, perhaps, may be attributed that "insolent attempt," as it has been designated, made by the Government in 1765, to abstract from the Life Offices what was called the "Unclaimed property,"—being, in fact, their surplus funds. "The peace, concluded in 1763, followed a war which cost upwards of a hundred millions, and the bribery which was necessary to carry the treaty through the House had contributed to exhaust the Treasury. Money was to be acquired, and the people grumbled at the taxation necessary to raise it. *In this dilemma it suddenly occurred to the ministers that there might be unclaimed property in the Assurance Offices, and, by some confusion of right and wrong, it was thought just to claim this private property for the public good.*" "Nothing," continues our historian, "could more decidedly approach confiscation. But in dealing with these Offices the Government was dealing with a large and influential body of proprietors, whose gains were aided by this 'dead cash,' and who were not men to see their purses invaded with impunity," and so, happily, the intended blow was averted. To the latter cause—want of caution with whom they did business—perhaps, we may attribute that series of frauds which blot the pages of Assurance History towards the close of the 18th century.

Turning to Mr. Francis' *Annals*, as we do wherever the "romance" of Life Assurance is to be touched upon, and glancing rapidly over the pages of this period, we find recorded how a man named Innes, having insured the life of his step-daughter in the *Equitable* Office, and having forged a will for the purpose of defrauding the Office, suffered death on the gallows for his crime. How the *London Assurance* Company was defrauded of £2,000 by a clever *substitution of lives*. How an "Eastern lady" obtained several thousand pounds from a London Office, on the sudden death of her husband advanced in years. How some further attempts by the same lady, to "introduce" some other persons to the Life Offices, failed. How, at a later period, a whole batch of Offices were nearly swindled by the designing Thomas Griffith Wainwright—the "Janus Weathercock" of his day—who first heavily assured, and then destroyed, the life of the beautiful Helen Abercrombie. How an equally consummate, if less guilty, scoundrel three times passed off his daughter, or, as most thought, his mistress, as *dead*, and each time obtained large sums of the Assurance Offices! These, and many other occurrences, prove that the best of Institutions may be applied to the worst of purposes.

CHAPTER V.

THIRD PERIOD—1816 TO 1844.

"THE GOLDEN AGE OF ASSURANCE COMPANIES."

To speak of this as the Golden Age of Assurance Companies may seem to disparage those Societies established at earlier dates. Our intention is not to do this. Indeed, those early Companies which are still existing, speak for themselves; they have all attained high positions, despite the difficulties they had to encounter, and the doubt which, for a time, surrounded them. Of those still earlier Societies, which have, happily, long since passed away, Dr. Price truly said that to call them impositions on the public, proceeding from ignorance, and supported by credulity and folly, was "too gentle a censure." But we shall be fully able to justify our position by a review of the advantages the Companies of this period possessed over those which preceded them.

These advantages may be ranged under several heads. First, and chiefly, the more accurate data which scientific investigation had placed at their disposal. Next, the rapid improvement which had been made, and was still taking place, in the mortality of the kingdom. Third, the legislative encouragement which had then been newly bestowed upon Life Assurance. And, lastly, as arising out of all these, the improved public feeling which had set in in favour of such Companies.

Reviewing these in their reversed order: Assurance Companies had no longer to battle with unnecessary parliamentary difficulties, or to offer bribes of such an amount as to well nigh ruin them at their outset. An enlightened administration had seen the propriety of encouraging and multiplying provident associations; and a Prime Minister strengthened his position in the eyes of a mercantile nation, by announcing from his place in the House of Commons, his intention of exempting from Income Tax a portion of the income of those who had "recourse to that *easy, certain, and advantageous mode of providing for their families by assuring their lives*"—that portion being the amount which they invested in this manner. That the effect of this exemption was highly beneficial to the Offices of that period we have abundant proof; and, although it has been more recently revived in a modified form, we should not forget that we were originally indebted for it to that wise and great statesman, William Pitt, and

that, too, at a period when Life Assurance, far more than now, required to be rendered popular.

With respect to the improvement in the mortality of the kingdom, the facts are so surprising as to appear almost incredible if they had been presented by any less authority than that upon which we have them. The late Dr. Griffith Davies found, by "laborious investigation," the same number of persons which, in the early part of the 18th century, produced 106 deaths, would, at the commencement of the present century, furnish only sixty-six deaths, and from 1815 to 1820 only sixty-two; hence the mortality had been reduced two-fifths during the space of one century. The effects of this improvement in mortality, so far as Life Offices were concerned, are so apparent as to need no further comment here. An improvement is still going on, although not so marked as at the period of which we are speaking. There can be no doubt that to this favourable feature the large surpluses of some of the older Offices is, to some extent, traceable. To it we certainly owe the more equitable rates of some of the modern Offices.

But by for the most important element in originating the sound Companies of this period was the improved scientific information they could command. Mortality observations were no longer confined to the London Bills of Mortality, at a period when they were known to be be unusually high, or to the records of the town of Northampton, which had been dealt with as arising from a fixed population, whereas it afterwards turned out to be a progressive or increasing one. A much more extended range of observation had been taken. Not only had Norwich, Warrington, Holy Cross, and Chester furnished confirmatory results to those derived from London and Northampton, but a series of observations taken on the continent had been communicated to this country. Dr. Newman had recorded the births and burials in the city of Breslau, up to the close of the 17th century, and Dr. Halley's Breslau Table of Mortality, constructed therefrom, had now come to be known. M. Kersseboom had investigated the register of assignable annuities in Holland, for a period of 125 years before 1748, and drawn valuable conclusions therefrom. De Parcieux had examined the lists of the Tontine schemes in France, and the Necrologies of the Religious Houses, and constructed a Mortality Table, differing but slightly from the later results obtained in this country. Dr. Wargentin had condensed the results of seven enumerations of the entire population of Sweden into a practical form. The mortality of Vienna, Berlin, Brandenburg, and the Canton de Vaud, Switzerland, had been subjected to a like scrutiny; and to complete the enumeration, Mr. Joshua Milne had constructed from the observations of Dr. Heysham, upon the Mortality of Carlisle, that valuable Table which is now known throughout the world as the CARLISLE TABLE OF MORTALITY. The publication of this last took place in 1815; from this, no less than from the completion of the Northampton Table, may a new era in the Assurance world be dated.

It is not our intention here to explain the essential merits or defects of the several Mortality Tables we have enumerated; we shall have a special chapter for that purpose hereafter. But we have two points to notice, as bearing upon the progress of Life Assurance. First, the remarkable similarity of results derived from these several sources—a similarity sufficient to remove all doubts even from the most sceptical; and, next, the favourable mortality shown by the Carlisle Table, and confirmed by many of those just quoted, which enabled the Offices taking this Table for their basis, to charge, at all the younger ages of life, a much less rate of premium than that demanded by the older Offices, and thus, by reasonably cheapening, tending to extend, Life Assurance. On ages below 40, the difference in the Expectation of Life between the Northampton and Carlisle Tables ranged from 6 to 10 years in favour of the latter; while, with ages from 40 to 80, the difference ranges from 4 years down to 1 at the extreme ages.

Another favourable circumstance also assisted. The great success which had attended the *Equitable* Society up to this period had done much to popularise Life Assurance. Enormous "Bonuses," even although one knows he has to pay for them, are always attractive! But the *Equitable* had done so much business that it became careless about doing any more, and by 1816, its doors were, in effect, nearly closed to new comers. There was an evident fear either that the Office would become unmanageable if many more new members were admitted, or of selfishness on the part of those already assured that they would obtain too small a share in the surplus by its being divided amongst such large numbers. Hence, about the time we are speaking of, a resolution was come to, to confine the participation in the surplus to the 5,000 oldest existing policyholders for the time being. Perhaps this decision was fortunate; for it was better that the check should come voluntarily than by the force of circumstances. With increasing numbers the rates of bonus must have been very considerably reduced, or the stability of the Society endangered.*

We have been particular in enumerating the advantages which were enjoyed by the Offices, originated at this period, not for the purpose of bringing them conspicuously into note, any more than their general soundness, good management, and success will always claim for them, but rather that such advantages should be remembered before any invidious comparisons be drawn as against Offices which have had to encounter greater difficulties, or were too early or too late to participate in those or the like advantages. Never, perhaps, were there more great minds devoted to the investigation and perfection of a science, at any one period, than to the science of life probabilities at the period, or immediately prior to the period, just passed in review.

"We have had in England," remarks Mr. Samuel Brown, "Boyes, Simpson, De Moivre, Halley, Stirling, &c.; but we have carried out the practice in Life Assurance to a degree which, considering the

* *Vide* Mr. Morgan's Addresses to the Court of the *Equitable* Society.

short period elapsed, astonishes by the grandeur of the interests involved, and the vast amount of benefit which it has conferred upon Society." In 1830 appeared a *Treatise on Probability* in the Library of Useful Knowledge, by Sir J. W. Lubbock and Mr. Drinkwater Bethune, being the first attempt to make the subject popular to the great mass of the people; and, in 1838, Professor De Morgan, in his admirable *Essay on Probabilities, and on their application to Life Contingencies and Insurance Offices*, brought within the reach of the mere arithmetician the rules, which, if their demonstration must first be studied in the pages of Laplace, would be confined to Mathematicians of the highest order. The student who wishes to consult the higher branches of the subject in English, may study with advantage the article on the "Theory of Probabilities," also by Professor De Morgan, in the *Encyclopædia Metropolitana*, in which the substance of Laplace's great work is briefly given; and a treatise on the same subject by Mr. Galloway, published originally in the *Encyclopædia Britannica*, and afterwards, in 1839, in a separate volume, which contains a summary of the reasonings of Laplace, Condorcet, and Poisson.* "Great," adds Mr. Samuel Brown, "as has been the progress already made, the application of the theory is still only in its infancy in this country."†

On looking over a list of Offices of this period, the reader will not fail to be struck with the large proportion bearing the designation of "Mixed," as distinguishing them from the purely *Proprietary*, or the *Mutual*. Without entering upon the merits of these several systems, we simply call attention to the fact. Many of these Offices, indeed, started *Proprietary*, but they have since all become either *Mixed* or *Mutual*.‡

It is not to be supposed that the chronological list, which will be found in Appendix A, contains anything like the number of Offices that were started in the period of which we are speaking. Even in the "Golden Age," companies sprang up like gnats on a summer's evening, and disappeared as suddenly. From 1806 to 1826, we are told, more companies had been broken up than had been successful. Some went down in total insolvency; others lost a large portion of their capital; another set of Directors paid the *Provident* £21,000 to take their risks off their hands. Where is the *Rainbow* or the *Philanthropic*? the *Hercules* or the *St. James's*? the *St. Patrick* and the *Shamrock*? Echo answers, "*Where?*" Yet these were all veritable Assurance Offices in the days of yore. Jealousy was as rife in those days as now, and there was a strong feeling against the new Offices. The *Alliance* started in 1825, and having a *Marine* Assurance Branch, was a great source of annoyance to the companies who had, at an enormous outlay, charters with exclusive rights. But the Office was *respectably* and *economically* managed, and it has succeeded. With *these* conditions

* Among more recent works may be mentioned Professor Boole's *Laws of Thought*; Mr. Isaac Todhunter's *History of the Theory of Probabilities*; Dr. Venn's *Logic of Chance*; and Mr. Whitworth's *Choice and Chance*.

† *J.I.A.*, Vol. vi., p. 147.

‡ The word "mixed" is now very seldom used. What are now called proprietary Offices all issue Policies that participate in nearly the whole of the surplus.

there is still a fair chance for all; and we must entirely agree with a popular writer upon the subject, that "the old Companies have nothing to fear from the increase of fairly-constituted rivals." What they had to fear, and what all who are interested in the progress of Life Assurance had to fear, and mourn at, was the constant establishment of Companies holding forward delusive principles, or having no higher aim than to provide handsome incomes for pretentious Managers and needy Directors—men who neither deserve success nor know the means of securing it. This, appropriately enough, brings us to the next section of our subject.

CHAPTER VI.

FOURTH PERIOD—1844 TO 1862.

"BUBBLE COMPANIES."

THE period we have just passed over did much to popularise the practice of Life Assurance in this country. The speculative companies of a former period had passed out of memory. The principles of the existing Offices were fast becoming consolidated; and the companies themselves recognised as amongst the most valued monetary Institutions of the country. The magnitude of their transactions was only equalled or surpassed by those kindred institutions, banks; and the promptitude with which they met their engagements deservedly placed them high in public confidence. It was not to be supposed that such a state of things could long continue without a "dark side." Those who know most of human nature know, and deplore, that the best of institutions are the most liable to abuse. This has been proved more than once in the History of Life Assurance. The favourable results which had been achieved by sound management of the old Offices—more particularly the bonuses of the *Equitable*—which public rumour had extended even beyond their almost fabulous reality, had, coupled with a want of popular and correct knowledge of the principles and practise of Life Assurance, raised public expectation to a high pitch. To this circumstance, combined with the unlimited confidence before referred to, must we look for a solution of that blind reliance which was placed in many of the swindling schemes which were brought forward in the earlier years of the period we are entering on, and in the numerous abortive projects whose concoctors, after exhausting the large funds placed at their disposal, have left their dupes to ascertain the extent of their remaining liabilities, through communications made to them by the officials of the Court of Chancery.

Our exposition would be incomplete if we were not to go back to the great *West Middlesex* swindle, which may be regarded as the precursor of those we are about to speak of. It was originated in 1836, by two scoundrels, one of whom had been a journeyman shoemaker and a smuggler, and the other, William Hole, had been a tallow-chandler and a bankrupt. These two men contrived to draw from the public no less than £200,000 or £250,000, by the sale of *Annuities* at some *thirty* per cent. more favourable terms than any other existing Office could afford to offer, and by granting Life Assurances at similar reductions from the ordinary rates. Handsome Offices were opened in London, Edinburgh, Dublin, and Glasgow,

and the newspapers of the day teemed with their advertisements. Money came in from all quarters; but chiefly from those who should have been better informed, viz.: clergymen, half-pay officers, and people in the higher ranks of Society. These are the classes who most suffer from such schemes. The man of business is too wary to be caught by such transparencies.

If the disappointment and ruin which this one fraudulent scheme occasioned could be truly depicted, there is nothing in the realms of fiction which could equal it.

There was *then* no periodical specially devoted to the exposure of such schemes, and their promoters;—and we may add, happily, none to bolster them up, and thus aid and abet in the disgraceful work. It is true Mr. Peter Mackenzie, the editor of the *Scottish Reformer's Gazette*, published in Glasgow, did take great pains to expose this scheme, and must have incurred considerable outlay in defending the several actions which were brought against him: but he was too far from his work, and it was only when he had induced Sir Peter Laurie to commence an exposure in London, that the bubble really burst. But the evil, to the extent indicated, had already been accomplished.

How many similar schemes might have followed, and what mischief those which *did* follow might have done, but for an event which is closely allied with the Insurance history of this period, we of course have no means of knowing. Vast as the Insurance interest had at this time become, it had no special organ devoted to it, or to watch over its progress. The public interest, although great, was hardly of a character to commend it to the newspapers; and they (the newspapers) were hardly in a position to do the work well, for it required almost individual attention. In the year 1840, however, this defect was remedied by the establishment of the POST MAGAZINE,* a small weekly publication issued at the low price of one penny. Prior to the appearance of that little periodical, Life Assurance had not been regarded by the press of this country as a suitable topic for public discussion; and, probably, not one individual in twenty had any very accurate notion of what was meant by a Life Assurance Institution.

Those who had the advantage of being personally acquainted with the late Mr. J. Hooper Hartnoll, the originator and former proprietor and editor of that Paper, know how distasteful any personal adulation (even in these pages, which owe so much of any merit they may possess to his sound critical judgment) would have been to him. He was one of those *silent workers* to whom the world owes so much, *and goes on owing it!* But even this circumstance must not prevent us from completing our historic outline. The "special services" which called that Paper into fuller action, after the passing of the Act, 1844, happily now only exists in a limited degree; and many of its present readers only know by hearsay of its dauntless efforts some 18 or 20 years ago, in attacking parties who had combined for purposes of fraud, and given to their infamous project the alluring title of Assurance

* For an account of the origin and work of this publication see Chapter xxii.

Associations. Week after week, and year after year, it exposed schemes scarcely less daring than those of the "West Middlesex"—schemes only rendered less successful by reason of early exposure. Actions were brought against the editor, but he kept his ground, and never flinched from his task until he had unearthed the whole nest of insurance swindlers of that period. A condensed history of some of these schemes was subsequently furnished in Mr. Hartnoll's letter to the then President of the Board of Trade, the Right Hon. E. Cardwell, published in 1853.

The circumstances attending the "West Middlesex Swindle," at length drew the attention of the Legislature to the subject;—in like manner as the prevalence of gambling assurances, and the evil consequences resulting therefrom, had led to legislative measures a century before. Accordingly, towards the close of 1844, an Act was passed imposing certain restrictions upon all Insurance and other Joint-Stock Companies thereafter to be founded. But while the Act against gambling assurances *did* ultimately lead to their discontinuance, the Act for the regulation of "Joint-Stock Companies" did *not*, so far as Insurance Companies were concerned, succeed in its purpose, but had rather a contrary tendency, as the continued exposure in the *Post Magazine* of schemes concocted under protection of the Act, abundantly established.

In 1845, the first year after the passing of the first Joint-Stock Companies Act, there were no less than forty-eight Life Assurance Companies provisionally registered. Of this number twenty-one only, or less than one-half, became completely registered; and of these, but one is in existence at the present time, viz., the *Royal*. An able writer of that period drew the following comparison:—"Fertile as the year 1845 has been in railway projects, the majority of which, like the Jew pedlar's razors, were made for sale and not for use, it has been no less so in new Assurance Offices." He remarks that the evils from railway speculation may be only temporary; but "not so transient or temporary is the evil that will arise from these new Assurance Offices if they are not based upon sound principles and prudently conducted." He adds "a scheme of this kind is concocted no less easily than a railroad; its birth-place being in like manner the solicitor's office, and its object the especial benefit of the firm, and its friend the secretary—or, as is now the more favourite term, the *Managing Director!*"*

Notwithstanding the exposure of such schemes in the pages of the periodical before referred to, many of them contrived to obtain large sums of money, and still more have been required from the sufferers on their winding-up—for the greater part of them eventually arrived at that process. The loss, of course, fell either on the shareholders or the assured: for the most part, and very properly, on the former. In all cases the assured suffered by missing the advantages they might have received for the same outlay of premium in better-constituted Companies.

* *Life Assurance Offices, New and Speculative*, published 1846.

In the cases of two mutual Offices established in this year, the *assured* were held liable for the debts of the Societies.

The majority of the unsuccessful Offices transferred their business, and were wound-up by mutual arrangement. The causes of the failure of so many Offices may be classified under a very few heads: 1. Want of *bonâ fide* intentions at starting. 2. Want of practical experience on the part of the promoters. 3. Extravagant and unsound management.

It is far from our intention to imply that *all* the Offices of this period come under the denomination of "bubble Companies." We by no means join in the cry against the new Offices, except so far as the reckless proceedings of many of them exposed them to censure. It is as unjust to believe all the new companies to have been bad, as it is foolish to believe them all to have been good, in the face of the flagrant disclosures to the contrary. We can point to some of the Offices of this period as achieving success—all circumstances taken into account—which has never been surpassed; and there are other Offices that have established a respectable business at a very small cost. We refrain from giving names; as it is not our object to flatter particular Companies, at the expense of others, which are possibly destined to become equally successful. The elements of sound management and economy are undoubtedly required, in order to secure success for an Assurance Office. But are they not equally necessary in any other mercantile undertaking? The funds of an Assurance Society are only the more sacred because they are held in trust for the benefit of widows and children; and he who would wilfully squander them should be held a criminal, and a traitor to his species; Nor should we forget the dictum of Mr. A. G. Finlaison, late Government Actuary, the truth of which all who are practically conversant with Insurance history must admit, "that thousands and thousands are brought to insure their lives by the agency of young Offices, who otherwise never would have heard of Life Assurance at all, and never would have come at all."*

It may be desirable—in order to avoid injustice to those that are respectable—to give some definition of "bubble Companies," and we cannot improve upon that furnished by the Parliamentary Committee on Joint Stock Companies, which sat in 1844. They classified them under three heads:—

1st. Those which, being faulty in their nature, inasmuch as they are founded on unsound calculation, *cannot succeed by any possibility*.

2nd. Those which, let their objects be good or bad, are so ill-constituted as to render it *probable* that the miscarriages or failures incident to mismanagement will attend them; and

3rd. Those which are faulty, or fraudulent in their object, being started for no other purpose than to create shares for the purpose of jobbing in them, or to create, under pretence

* Examination before Select Parliamentary Committee, 1853.

of carrying on a legitimate business, the opportunity and means of raising funds, to be shared by the adventurers who start the Company.

In the first class may be comprised those Offices which were continually springing up, offering "advantages" totally incompatible with the rates of premium charged: advantages which Offices with their *accumulated millions* would not dare to offer, because they would know they could not perform them!

The second, was, perhaps, a still more numerous class. Indeed, it is not too much to say, that at least *one-half* of the defunct Companies *might have succeeded under proper management;* that is to say, that if, instead of a course of disgraceful profusion, as evinced in elaborate offices, an extensive staff of officers, and liveried messengers, they had commenced, as did a few, with the fund for management expenses provided out of the Directors' pockets, and every step had been taken with due regard to the expenditure the Office could properly afford. Offices *so* managed have a vitality which no competition can destroy, and achieve successes which, in after years, are looked upon as little short of fabulous.

To the third class, happily, a check had been interposed; not, indeed, by legislative measures; for these, from their incompleteness, had rather opened up fresh facilities; but, as we have seen, by the enterprise of individuals actuated by a desire for the public good. An instance of the manner in which these schemes have been, brought before a "deluded public," may be productive of good, and is strictly illustrative of the period we are now upon.

The Company we select shall be the *London Marine Brokers*, which endeavoured to secure public confidence by opening an account; or, at all events, by announcing as its bankers, the Royal British Bank! and by registering a list of forty shareholders, purporting to hold some 1,000 or 1,200 shares in the concern. Our authority is the report of the Parliamentary Committee on Assurance Associations in 1853: *their* authority the POST MAGAZINE. No. 1, the promoter of the Company, J. N. Burnand, held 20 shares; No. 2, Joseph Williams, a coffee broker, 50 shares; but *he* declared he had never heard of the Company, and knew nothing about any shares; No. 3 was Richard Hopkins, whose address turned out to be a public-house, and the landlady declared she had occupied the place for nineteen years, and no such person had ever lived there! Robert Richardson was put down for 20 shares, and his address Oxford Market, but no such person could be found. William Joyce, who figured for 30 shares, upon enquiry was also *non est.* The same of Henry Somerset and his 10 shares. Henry Bladon Savory, who stood for 50 shares, was found; his wife was a charwoman, at "26, Hunter Street, Brunswick Square." Savory was described in the Share list as an *accountant;* whereas his real occupation was that of porter to the Company, at their Office, Royal Exchange Buildings! All those, indeed, who turned up at all, turned up bad. One, who was reputed to have signed his name for 40 shares, was found only capable of

"making his mark." Another had been employed to "get names" to powers of attorney for the Company. A third had signed for shares "because others did so;" and the last absolutely signed for a "pot of beer." Surely a case has been made out in support of our title of "Bubble Companies!"

It is a fortunate event that such a large proportion of the new Offices so early ceased to exist; for if many of them had continued longer, and pursued the same course of management, the evil would have been very much greater. The penalty of unsound management is, that it produces its own remedy: for public confidence is shaken, and the scheme falls to the ground—the assured, it is to be hoped, gaining wisdom, and seeking in future more solid establishments.

The position of Life Assurance Companies under the Act of 1844, which, as we have seen, gave rise to so many abuses, at last attracted the attention of the Legislature. In March, 1853, a Select Parliamentary Committee was appointed to take into consideration the subject of these Companies, with a view to future legislation. About the same time, the Institute of Actuaries, which had been founded in 1848, in circumstances described in a future chapter,* was also exceedingly active in its endeavours to secure such a change in the law as might place Life Offices on a much sounder basis than was then the case. This body passed a series of Resolutions, the first of which declared "That the Act of 1844, has created an invidious distinction between the Offices established prior to 1844, and those established since, and that the Act in question ought to be forthwith rejected and provision made for putting all existing Offices on an equal footing." These Resolutions, together with a considerable amount of expert evidence, were placed before the Parliamentary Committee, who made an elaborate Report upon the subject, the substance of which is contained in the following paragraph :—

"With regard to the general condition of existing Companies, so far as any evidence has been laid before your Committee, they feel it their duty to report that it is more satisfactory than they had been led to believe before they entered upon their enquiry. No doubt, instances of great abuses and flagrant frauds have been disclosed by the witnesses examined, but in general, these consisted of an open violation of all law, more akin to swindling than to regular trade, and such as it would be difficult for any legislation to prevent, so long as private persons exercise so little precaution in the conduct of their own affairs. But, while the Committee are enabled to speak in these satisfactory terms of existing Offices so far as the evidence has gone, their attention has been called to the great facilities which exist under the present state of the law for Insurance Companies, in common with others, being brought into existence with no reasonable prospect of, or guarantee for, success, and not unfrequently without any *bonâ fide* intention of transacting business. It appears, by a return made to your Committee from the office of the Registrar, that, since the passing of the Act of 1844, no fewer than 311 Insurance Companies of various kinds have been provisionally registered, of which only 140 were completely registered, and of which only 96 continue to exist at this time. And, while your Committee have reason to believe that some of the Companies which have ceased to exist during that period have been absorbed in other Companies by whom their business has been taken over, yet, at

* See Chapter xxi.

the same time, they have no doubt that considerable traffic has been carried on in the mere creation of Companies which never had any real prospect of a *bonâ fide* existence."

The Committee recommended an amendment in the state of the law, and, on the ground that the business of Life Assurance Companies differed so much from that of other Companies, advised a repeal of these provisions of the Act of 1844, so far as they related to these particular Companies which, they were of opinion, should be dealt with separately.

No immediate legislation followed the Report of this Committee. In 1856, however, Mr. James Wilson, the Secretary to the Treasury, introduced a Bill into the House of Commons, containing provisions for the improvement of the existing law regarding Life Assurance Companies; but, partly from its incomplete character, and partly from the opposition of the other Offices, it was withdrawn at an early stage. Another Bill with a similar object in view, introduced into Parliament during the Session of 1850, met with a like fate.

By an extraordinary blunder, an Act was passed in 1856, which expressly repealed the provisions of the Act of 1844, as far as they related to Life Assurance Companies, without substituting other provisions. This blunder was rectified in the following Session by means of a short Act. The returns of Life Offices, established during the latter part of 1856 and the first eight months of 1857, are consequently more or less defective.

CHAPTER VII.

FIFTH PERIOD—1862 TO 1870.

"LIMITED LIABILITY COMPANIES."

This period, though short, was yet an eventful one for Life Assurance Companies. It commenced with the passing of the important statute known as "The Companies Act, 1862." Two years later a Government Scheme of Life Assurance and Annuities was carried into effect by means of the Post Office. In 1867 "The Policies of Assurance Act," which related to Notices of Assignment, and which we give in full in Appendix B, was passed. The year 1869 was distinguished by two events of importance to Life Offices, one being the publication of the Institute of Actuaries' Mortality Tables, and the other the failure of the *Albert* Life Office, to be closely followed by that of the *European* Life Office. Of the influence of these events upon the business of Life Assurance we shall now speak.

By "The Companies Act, 1862," the privilege of Limited Liability, which, under the previous Acts had been granted to all other Companies, was extended to Life Assurance Companies. This privilege, prior to the passing of the Act, could only be obtained by Life Offices, either by virtue of a special Act of Parliament or under Letters Patent. The principal advantage of such a privilege is that really responsible persons may become shareholders of a Company without incurring a risk beyond the amount of their share in the uncalled Capital. Under the old law of unlimited liability shareholders in Life Assurance Companies stood to lose all that they possessed, and this circumstance caused the promotion of such Companies by speculators rather than by men having a reputation to lose. The application of the principle of Limited Liability to Life Assurance Companies has proved to be of incalculable value, both to the shareholders and the assured, since more than anything else it has raised the status of such Companies to an equality with that of Banks and similar institutions of high standing.

The leading provisions of this Act affecting Life Offices relate to their formation, registration, and winding-up. Under Section 4 of the Act the formation of any Association of more than twenty persons for the purpose of carrying on any business for the acquisition of gain is prohibited, unless it be registered under the Act, or formed in pursuance of a private Act or of Letters Patent; while at the same

time Section 6 provides that "any seven or more persons associated for lawful purpose, may, by subscribing their names to a Memorandum of Association, or otherwise complying with the requisitions of this Act in respect of registration, form an Incorporated Company with or without Limited Liability." The Act, under Section 209, made it compulsory for all Life Assurance Companies, completely registered under the Act of 1844, which it repealed, to be registered before 2nd November, 1862, non-compliance with this provision subjecting the Directors to heavy penalities, as well as rendering the Companies incapable of suing or paying dividends. With regard to other Companies registration, which conferred the privilege of incorporation, was entirely optional. The effect of such registration is "that the constitution of a Company under the Act of 1862 is widely elastic so far as its internal affairs are concerned; but the Company is rigidly bound down to the particular objects specified in the documents registered at the time when it was incorporated."

A considerable portion of the Act relates to the winding-up of Companies, whether registered or not under its provisions. This subject is, however, of too technical a nature to be dealt with here, and those who wish to study it are referred to the standard works of Bunyon and Crawley.

The Government Scheme of Life Assurance and Annuities which came into operation in 1864 has proved to be a failure, chiefly owing to the fact that, except by means of leaflets issued to Savings Bank depositors, and notices set up in the various Post Offices, the advantages of the Scheme have never been brought prominently before the notice of the public. Hence the Scheme cannot be said to have been in real competition with the business of Life Offices, in spite of the fact that those who take advantage of it have direct Government security. Under this Scheme Life Assurance Policies from £5 to £100 may be granted to persons between the ages of 14 and 65, while children between 8 and 14 years of age can be insured for £5. The amount of Annuity that can be purchased on a single life is limited to £100. In the case of Life Assurances up to the amount of £25 a medical examination may be dispensed with, subject to certain conditions in the event of death before three full premiums have been paid.

The effect of "The Policies of Assurance Act, 1867," has been to simplify the difficulties connected with Notices of Assignment. The Act also provides a statutory form of *absolute* assignment, which, if properly stamped, is quite sufficient to effect a transfer of a Policy from one owner to another.

The publication in 1869 of the Institute of Actuaries' Mortality Table, based upon the combined Experience of Twenty Life Assurance Companies, which was followed three years later by monetary Tables, provided a means of testing the stability of Life Offices by a more stringent process than had previously been the case. This Table has now practically superseded all others in the valuation of Life Assurance contracts.

The failure of the *Albert* Life Assurance Company in August of that year caused great consternation throughout the world of Life Assurance, owing to the far-reaching nature of the disaster. This Company, which had been founded in 1838, had during its existence absorbed no less than 26 other Life Offices. For a long time there had been a deficiency in its funds on account of the reckless manner in which the Office had been managed. This circumstance, however, only came to light on the death of the manager in the previous year. A searching investigation was made into the causes of the failure, which, it was found, was mainly due to the large sums paid away for acquiring the businesses of the numerous Offices which had been transferred to the Company. The various claims of the policyholders and other creditors formed the subject of a special Court of Arbitration presided over by the late Lord Cairns.

The subsequent collapse of the *European* Life Assurance Company, which, though it commenced a month after the *Albert* had closed its doors, did not culminate till some three years later, added considerably to the difficulties, that, owing to defective legislation on the subject of their control, surrounded these Companies. It was the combination of these two failures which led to the Government taking prompt action in the matter. In 1870, a Bill was introduced into Parliament, which, without interfering unduly with their business, was designed to effectually prevent a repetition of such disasters in the future. This Bill, after considerable discussion upon and modification of some of its provisions, became law on the 9th August, and thus opened for Life Offices an entirely new era—an era which has been accompanied by unbroken prosperity.

CHAPTER VIII.

SIXTH PERIOD—1870 TO 1900.

"FREEDOM AND PUBLICITY."

We closed the last chapter with a reference to the Bill which ultimately developed into "The Life Assurance Companies Act, 1870." The provisions of this Act are of so important a character that no apology is needed for giving, in addition to the full text of the Statute in Appendix B, an outline of its scope and of its general effect upon Life Assurance business in this country.

The first provision of the Act was to require from every subsequently-established Life Office a deposit with the Court of Chancery of the sum of £20,000, to be retained by the Court until such period as the Life Assurance Fund accumulated out of the premiums had amounted to £40,000. This provision applied not only to British Offices, but also to Foreign and Colonial Offices commencing business in this country. These latter Companies, however, having already accumulated this amount in premiums, simply contented themselves with formally paying in the Deposit, and immediately afterwards withdrawing it. The object of this provision was to prevent the formation of speculative concerns, such as had been so common since the Act of 1844, and which, as we have seen, had ended almost without exception in disaster. In this it has been entirely successful, although one effect of this provision, probably unforeseen by its framers, has been to make the establishment of Mutual Offices a matter of impossibility.*

The next provision related to the separation of the Life Assurance Fund from other Funds. This was followed by six sections dealing with the subject of the preparation and publication of statements with regard to the financial position of the Company. These statements are of two kinds, one being an annual one giving the Revenue Account and Balance Sheet of the Company, and the other a statement of a much more elaborate character, to be made at the end of certain periods, from a study of which an opinion may without difficulty be formed as to the solvency or otherwise of the Company.

* Shortly after this Act was passed, it was contemplated to form a Ladies' Life Assurance Company, making it lawful for married women to assure their lives with their own money, without the consent of their husbands. One lady offered to advance £2,000 if nine other ladies would contribute a like sum in order to provide the £20,000 required under the Act. The Directors and Employees were all to be women.

The remaining portions of the Act relate to amalgamations, transfers of business, and the winding-up of insolvent Companies. Section 14 requires that before either an amalgamation or transfer between two Offices takes place, an application shall be made to the Court of Chancery for its sanction to the proposed arrangement, this sanction being withheld in the event of the opposition of policy-holders representing one-tenth of the total amount assured in one of the Companies. In a recent case, however, where the sanction of the Court had been withheld on this ground, the transfer was effected in another manner under the provisions of "The Joint Stock Companies Arrangement Act, 1870," which are less stringent in this respect. A new feature in the winding-up of an insolvent Company was introduced by Section 22. which permits of a reduction of contracts intead of a distribution of assets. This provision very much mitigates the hardship of the case where an assured is in a bad state of health and would consequently derive a greater benefit by a reduction of the sum assured than from an insignificant surrender-value.

In the two following Sessions of Parliament the Act received some slight amendments, which rendered it more workable, and also cleared up some doubts as to the meaning of some of its provisions.

The general effect of the Act upon Life Offices has been admirably summed up by Mr. George King in the following words:— "Almost without exception," he tells us, "they have gradually increased the proportion of their assets to their liabilities, the grand total of the addition to the reserves, entirely irrespective of the natural increase of business, and of the higher average age of the lives assured, being enormous; and the result is that in no country of the world are the Life Offices so strong and so stable as in Great Britain, and nowhere do the assured enjoy greater advantages in respect of bonus and other benefits. . . . This most satisfactory condition of affairs here is due in great part, I think, to the freedom and publicity which reign, because freedom and publicity result directly in the conservative policy of increasing the funds, or indirectly therefrom in enhanced profits to the assured."*

The year 1870 is a memorable one in the annals of Life Assurance, not only for the passing of "The Life Assurance Companies Act," but for two other reasons. The same Session which witnessed the entry of this Act upon the Statute Book saw also the successful passage of a Bill removing certain disabilities of married women, as well as providing means for Policies of Assurance to be effected for their benefit by their husbands, who are thereby protected from creditors. This Bill became the well-known "Married Women's Property Act, 1870," afterwards amended twelve years later by an Act of an even more revolutionary type. The other event of the year was the establishment for the first time in this country of two great American Life Offices, which, after thirty years' residence here, show no signs of a desire to leave us. Since this

* *J.I.A.* xxix., p. 491.

date they have been joined by two others—one being based entirely on the Assessment System—and within the last few years by four Australian and two Canadian Offices, all of which appear to have taken root in this country without materially affecting the business of purely British Offices.

Since the Life Assurance Companies Act came into operation a period of thirty years has now elapsed, during which there has taken place a most remarkable change in the position and general practice of Life Assurance Offices. As we remarked at the close of the last chapter, this period has been one of unbroken prosperity, and for many reasons. Actuarial science, fostered and developed by the Institute of Actuaries in England and the Faculty of Actuaries in Scotland, has become better understood, and hence received wider recognition by the responsible officials of Life Offices, few of which do not number on their staff men who, by passing examinations under the auspices of these bodies, have duly qualified themselves as actuaries, and who accordingly are better able than formerly to promote schemes, at once sound and popular, for the benefit of the assured. Partly from this cause, partly from the publicity resulting from the provisions of the Life Assurance Companies Act, and partly from the active competition between Offices increasing in intensity year by year, a number of substantial improvements and more liberal conditions have been introduced within recent years into the prospectuses of Life Assurance Companies. Of these, which include such advantages as the freedom of policies from harassing restrictions, the extension of time given to the revival of lapsed policies, and the payment of claims immediately upon proof of death and title, we shall treat fully in a subsequent chapter.

In making a comparison between the position of Life Offices in 1870 and in 1900 a number of circumstances must necessarily be taken into consideration. If, for example, we look at the amount of assurance per head of the population, we find that it has more than doubled during the intervening period. This, of course, is due, not merely to the habits of thrift which the advance of education has inculcated into the minds of the people, but also to the readiness which is now shown by Life Offices to bring forward to the notice of all classess of the community methods of Life Assurance adapted to meet every kind of requirement. No feature of Life Assurance has grown into more popular favour during the last ten or twenty years than that of Endowment Assurance, which consists of an assurance of an amount payable either at the end of a certain period or earlier in the event of previous death. One reason for the increased popularity of this class of assurance is that it is only within comparatively recent years that these assurances have been granted with participation in profits.

If, again, we examine the financial position of the various Life Offices at the beginning and end of this period, we discover that, consequent upon the rate of interest employed in the valuation being now on the average more than one per cent. lower than it was

formerly, and also upon the substitution for the Carlisle Mortality as a standard the more stringent H^M Table, the reserves have become far heavier in proportion to the liabilities. While, however, by thus considerably strengthening their reserves, Life Assurance Companies have placed themselves in a much healthier condition than they even were before, the bonuses which they are able to divide periodically have not shown signs of being lower in amount. Owing, however, to the improved and more equitable manner in which they are distributed among the different classes of assured than they were thirty years ago, it is almost impossible to make a fair comparison in this respect.

On the other hand, however, the competition to which we have alluded has had the effect of increasing to a great extent the proportion which the Expenses of Management incurred by Life Offices bear to their Premium Incomes. Life Business is now-a-days far more difficult to obtain than was the case thirty years ago, hence there has gradually sprung up during this period an entirely different mode of organization. Branch Offices, with quite an army of Inspectors and Agents, have been established in every large town throughout the country. These have necessarily entailed an enormous outlay on the part of Life Assurance Companies. Another tendency, which has become noticeable since the Act of 1870, and which is perhaps not altogether desirable, is that of the gradual diminution in the number of Life Offices. Few new Offices have been successfully established during the last thirty years, while on the other hand a considerable number have either amalgamated with other offices, or have transferred their business to existing Companies, or, being discovered to be insolvent, have been wound up under the Act. Instead of a large number of small Offices, as was formerly the case, there is now a comparatively small number of large Offices, most of which have at one time or another absorbed others less able to fight alone against increasing competition. If we compare the number of Offices existing in 1870 with the number in 1900 we shall find that the latter number is only about two-thirds of the former.

In addressing the members of the Yorkshire Insurance Institute a few years ago, Mr. R. P. Hardy, than whom there is no greater authority on Life Assurance matters during the last half century, takes a somewhat gloomy view of the question as it appears at the close of the nineteenth century. "With the exception of a recent rise in the value of certain stocks," he remarks, "no Assurance Company has had the means of making profits upon anything like the same scale for many years past, and certainly has no sure opportunities now. There is now among the public generally a scarcely controlled impatience for the immediate exhibition of showy Bonus results, which our sounder-thinking ancestors fully recognized could not be produced by any system of finance both safe and equitable; this is possibly in a measure due to the levelling spirit of the age that allows less weight to all considerations affecting the past, and would fain put the oldest policyholder upon no better

footing than the last entrant. There has also arisen a fallacious vulgar belief in the grandeur and absolute importance of mere big figures—no matter at what cost they are obtained. Such are erroneously supposed to testify to the extent of a popular approval at once discriminating and sagacious."

While, however, a large section of the general public is certainly attracted by "showy Bonus results" and "big figures," it may be doubted whether this section has an undue influence upon the practice of Life Offices in these respects. At no time during the history of Life Assurance has there existed a stronger desire among Directors and Managers to put stability and safety in the first place and high rates of Bonus in a subordinate position. During the last thirty years we have seen not only more stringent Mortality Tables employed, although it is a fact that human longevity has improved, but the rate of interest assured in the calculations has been gradually lowered from 4 per cent. to $3\frac{1}{2}$, from $3\frac{1}{2}$ to 3, and from 3 to $2\frac{3}{4}$ or $2\frac{1}{2}$ per cent. The public are beginning to appreciate the importance of selecting an Office which sets aside ample reserves to meet its future liabilities, and as long as this principle takes the highest place in the minds of intending policyholders, so long will Life Assurance continue to flourish.

CHAPTER IX.

THE RATE OF INTEREST—ITS HISTORY AND OPERATION.

In tracing the progress of Life Assurance we took occasion to direct attention to the early writers on the subject of *Interest.* A correct understanding of the operations of the latter was necessary to the proper development of the former. Their growth, therefore, was almost necessarily concurrent, and to some extent identical; for the earlier writers directed attention to both. The late Mr. W. B. Hodge, in an excellent paper on the *rates of interest for the use of money in ancient and modern times*, read before the Institute of Actuaries, says—"The object of the actuary, in applying the science of vital statistics to pecuniary transactions, being to determine the values of payments dependent upon conditions of human survivorship, and therefore necessarily deferred for periods of longer or shorter duration, it is obvious that the *rate of interest at which money may be increased* is an element of his calculations, nearly if not quite as important as the probable risk of mortality that may effect the lives involved."*

Interest, in the sense of a recompense or return for money lent, must have originated very early in the world's history, probably dating with the earliest mercantile transactions. There are frequent allusions to it in the scripture, chiefly however under the title of "usury," which appears to be the old English word for interest. In the Latin this word signifies money paid for the use of money lent; but the more learned assert it to be a Hebrew expression signifying "that which bites"—an exceedingly proper derivation as the term is now understood; but it was originally applied to *all profit* paid for the use of money.† The term *usury* is now understood only in the sense of taking more interest for the use of money than the *law* allows. Hume, the English historian, speaks of the adoption of the word *interest* as "a lucky accident in language which has great effect on men's ideas." Another historian, Robertson, tells us that the fixed rate of interest in the 12th century was 20 per cent. In 1560, it was fixed in Spain, Germany, and Flanders, by the Emperor Charles V., at 12 per cent. Till the 15th century no *Christians* were allowed to receive interest of money, and *Jews* were the only usurers. This led to the frequent persecution and banishment of this sect of wanderers.

* *Vide J. I. A.*, Vol. vi., p. 301.
† *Vide* Mr. Hodge's Paper.

We learn, upon what appears to be good authority,* that the lowest rate of interest in Athens was 10 per cent. per annum, and the highest 36 per cent.: the ordinary rate being from 12 to 18 per cent. In Rome similarly exorbitant rates were exacted; but the wisdom of her law-givers soon devised some reasonable restrictions. About the year B.C. 346, the rate was limited to 5 per cent.; and five years later (B.C. 341), in a time of great public commotion, and amid distress so severe and universal as to cause a general bankruptcy, or entire abolition of all debts, the practice of taking interest for money was altogether forbidden, and he who received more than he had advanced was rendered liable to four-fold restitution.† These prohibitions continued some time in force, although they were frequently evaded. How long they exercised a beneficial influence we cannot say; but we are told by Adam Smith that the "virtuous Brutus," who flourished in the last century before the birth of Christ, "lent money in Cyprus at 48 per cent.," as indeed may be learned from the letters of Cicero. Under Alexander Severus (A.D. 230) the rate at Rome was reduced by legal enactment to 4 per cent.

It is not to be wondered, when such extortionate rates of interest from time to time prevailed, that usury grew very early, and very much, into disrepute. In the book of Ezekiel (xviii. 13), he that "hath given forth upon usury, and hath taken increase," is placed in the same class and threatened with the same judgments as the idolater and the adulterer, the robber and the shedder of blood. In the fifth chapter of Nehemiah, 10th verse, it is written, "I pray you let us leave off this usury;" and in the 11th verse, "Restore, I pray you, to them, even this day, their lands, their vineyards, their oliveyards, and their houses; also the hundredth part of the money, and of the corn, the wine and the oil, that ye exact of them." So that interest was probably taken "in kind," as well as in money. "The hundredth part," here referred to, is supposed to have been a monthly return for money on goods lent, being at the rate of 12 per cent. per annum, "which is supposed to have been the usual rate of interest in Judœa at the time."‡

The earliest enactment upon the subject mentioned in English history, is an Act passed in the reign of Richard I. (A.D. 1197), *forbidding Christians to take interest for money.* It is mentioned in Macpherson's *History of Commerce*, as one of the conditions of Magna Charta, granted in the 17th year of John (15th June, 1215), "That the debts of a minor shall not bear interest, whether they be owing to a Jew, to the King, or any other person:" a statement, says Mr. Hodge, that would tend to show it was not only permissible but usual for the King and his Christian subjects to practise usury: and Macpherson remarks, "That would seem to authorize interest, *though repeatedly forbidden by the ecclesiastical canons.*" Twenty years later (1235) the statute of Merton, 20 Henry III., enacted that "usurers

* Bœckh's *Public Economy of Athens*, translated by Sir G. C. Lewis, 1842.
† Hodge, quoted from Arnold, ii., p. 126.
‡ Hodge, p. 303.

shall not run against any within age from the time of the death of his ancestor, whose heir he is, until his lawful age."

It was about this period that a number of wealthy Italians left their native cities, where they had acquired their riches by commerce, and spread themselves through Europe in the capacity of money-lenders. They settled in London in large numbers, and engaged in marine insurances and other speculations suited to their vast pecuniary wealth. They were called "Lombards," and their locality yet bears their name: it is still the street of money-lenders, banks, insurance brokers, and bill discounters. The Lombards grew into repute both with sovereigns and the clergy, and to a great extent usurped alike the business and the wealth of the Jews. An open warfare, indeed, was waged against these latter, more particularly by those who were indebted to them, and who for obvious reasons were desirous of seeing them expelled the country. Henry II. levied heavy exaction upon them; and at the coronation of his successor, Richard I., the populace, apparently under the Royal sanction, massacred and plundered all the individuals of that unfortunate class who fell into their hands. In the following year (1190) a similar outrage took place in York, and Hume tells us, "The gentry of the neighbourhood, who were all indebted to the Jews, ran to the Cathedral, where their bonds were kept, and made a solemn bonfire of the papers before the altar." Stow, in his *Survey of London*, says (A.D. 1263), "The barons slew the Jews at London, seven hundred; the rest were spoiled, and their synagogue defaced, because one Jew would have forced a Christian to have paid more than two-pence for the loan of twenty shillings a week." And a few years later (1290) Edward I. banished all the Jews from England, confiscating the whole of their property, with the exception of sufficient "to beare their charges till they were out of his realme." Stow says the number so expelled was 15,060, whose houses being sold, "the King made a mighty masse of money."

The spirit which tolerated or directed these persecutions sufficiently accounts for some of the legal enactments which followed. The "Statute of Jewry," passed in the reign of this Edward, after reciting that the King has seen divers evils and the disinheriting of good men of his land from the usuries of the Jews—albeit he and his ancestors had received much benefit from the Jewish people in times past—enacts "nevertheless, for the honour of God and the common benefit of the people, that from henceforth no Jew shall lend anything upon usury, either upon land, or upon rent, or upon other thing, and that no usuries shall run in time coming from the feast of St. Edmund last past (retrospective legislation!); and if any Jew shall lend at usury, contrary to this ordinance, the King will not lend his aid, neither by himself or his officers, for the recovery of the loan, but will punish him at his discression for the offence." After regulating the places of residence of the Jews—Old Jewry and Jewry Street, Aldgate, were probably among these—the statute further enacts "That every Jew above seven years of age shall wear a badge, and every one above twelve shall pay threepence tax yearly to the King, 'whose bondsman

he is.'" This statute is attributed by Mr. Hodge to the influence of the Lombards, "which about this time had reached its highest pitch at the English Court." The next general enactment bearing upon the subject, of which we have any direct knowledge, was passed in the 3rd Henry VII. (1488) and is entitled "An Act against Usurie and Unlawful Bargaynes," and recites that "ymportable damages, losses, and empoverysshing of this realme, ys had by dampnable bargaynes, groundyt in usurie, colorde by the name of new chevesaunce (agreement), &c. &c.," and enacts that all such contracts shall be void, and the seller, owner, bargainer, or promiser be liable to a penalty of £100 for every such bargain. "The Chancellour of Inglonde" was empowered to try such causes out of the city or burgh where the offence took place, as probably from local influences "lytell of the premysses" would be fulfilled. The Act itself was, however, repealed eight years afterwards on the ground that it was "so obscure, darke, and diffuse, that the true intent of the makers thereof could not be perfectly understood." The prohibition of usury, however, was again enacted, with the penalty of the forfeiture of one moiety of the goods, chattels, or merchandises that might be the subject of usurious bargains.*

Some of our readers may not have discovered the bearing of this apparent digression on the subject under consideration. The early abuses in connection with usury first directed the attention of the Legislature to provide remedies; and ultimately led to the *fixing, or limiting, the rate of interest by the State;* a step which, although no doubt fraught with many and serious disadvantages in a highly-developed mercantile community where the laws of supply and demand are understood and appreciated, was a great safeguard in a less advanced stage of society, and tended to prevent the earlier Assurance Societies from anticipating a higher rate of interest than they might afterwards have obtained: thus curtailing at least one of the elements of misfortune. At the time we have now arrived at, 1546, in the 37th year of the reign of Henry VIII., the first Act was passed defining or limiting the legal rate of interest to be charged in England. This Act recites that "diverse and sondrie actes, statutes, and lawes have been ordeyned, had, and made within this realme for the avoidance and punishment of usurie," and fixed the rate of interest for the future *at* 10 *per cent.* It, however, only continued in force for seven years, when it was repealed (1st May, 1552) by the 5 and 6 Edward VI., cap. 20. This last Act was entitled "A Bill against Usurie," and after much violent abuse of the "greedie, uncharitable, and covetous persons" guilty thereof, re-enacted the prohibition contained in the previous Acts we have noted, with nearly similar penalties.

"Notwithstanding, or perhaps in consequence of, this Act," says Mr. Hodge, in the paper before referred to, "the ordinary rate of interest after it passed was 14 per cent.;"—Queen Mary herself

* Hodge, p. 330.

borrowing money of the citizens of London at 12 per cent. Concurrently with the last-named Act, we are told by the same authority, a statute was passed forbidding any but the King's Exchangers to exchange or rechange gold or silver for the purpose of profit. Many Acts had been directed against this practice, which "appears to have been looked upon with as much jealousy as usury itself." These must have operated unfavourably for the Lombards.

The statute of 1552 (5 and 6 Edward, cap. 20) remained in force until 1571, when it was repealed by the 13th Elizabeth, cap. 8, which recites that the said "Acte hath not done so much good as was hoped; but rather that the vice of usurie, and especially by waye of sales of wares, and shiftes of interest, *hath more exceedingly abounded.*" The limitation of the rate of interest to 10 per cent., enacted by the 37th Henry VIII., was then revived, with the mild penalty, however, that any offender against the statute was to forfeit so much as should be reserved by way of usury above the principal for any money so lent or forborne. Another clause enacted that such offenders were also to be punished and corrected according to the *ecclesiastical laws against usury*—a reservation, says Mr. Hodge, of the power of the Church included in nearly all the Acts for the repression of the offence. The Act was to remain only five years in force, unless renewed, which it was several times, and "made perpetual" in the 39th year of the reign of Elizabeth.* This perpetuality lasted for about 30 years; for in 1623 (21 James I.,) the rate was reduced to 8 per cent., and the word *interest* first used instead of usury.† The Rump Parliament, in 1651, reduced the rate to *six* per cent., and this was confirmed at the Restoration. In 1713, in the 13th year of the reign of Queen Anne, the limitation became reduced to *five* per cent., and remained so, with one or two temporary suspensions, during periods of great commercial pressure, until the restraint on interest was totally removed by an Act in 1854. During the Protectorship of Cromwell the Jews regained their wonted position of money-lenders, and have since retained it without much interference or persecution.

Leybourn, in his *Panarithmologia*, published in 1693, and already quoted in previous chapters, gives us some information as to the rates of interest prevalent in this Kingdom at that period, 160 years ago. Referring to a series of Tables he had published, he says,

* "This salutary statute," says the writer of a clever article on Interest, in the *Encyclopædia Britannica*, 7th Ed., "was opposed even by those who it might have been expected would have been among the first to emancipate themselves from the prejudices of the age with all the violence of ignorant superstition. Dr. John Wilson, a man famous in his day, and celebrated for the extent and solidity of his learning, stated, in his place in the House of Commons, that 'it was not the amount of the interest taken that constituted the crime; but that all lending for any gain, be it ever so little, was wickedness before God and man, and a damnable deed in itself, and that there was no mean in this vice any more than in murder or theft.' In order to quiet the consciences of the bench of Bishops, a clause was actually inserted declaring *all* usury to have been forbidden by the law of God, and to be in its nature sin, and detestable. At first, this statute was limited to a period of five years; but 'forasmuch as it was by proof and experience found to be very necessary and profitable for the commonwealth of this realm,' it was in the same reign made perpetual."—39th Elizabeth, cap. 18.

† "At the beginning of the 17th century, land was commonly bought at 20 years' purchase, and never at less than 16 years' purchase; while at the end of the century it was still at 20 years purchase."—De Morgan.

"Each Table may most properly be appropriated to the nature of the thing to be purchased, as—1. The Table of *five* per cent. may most fitly be used in the purchasing of *Freehold Land*, which, for its permanency, and being (of all other purchases) least liable to casualties, a man may, for the less profit, part with his money in such purposes—2. The Table of *six* per cent. (*which is the present authorised rate for money*) may most fitly be used in the purchase of *Copyhold Estates* and in *Leases of Land*, the one being subject to fines on every alienation, and other services; the other being but for term of years, and so may want encouragement for the improvement of the same.—3. The Table of *eight* per cent., which may be used in the purchase of leases of land, and of good new built *Houses* well *inhabited*, and standing in probable places for habitation.—4. The Table of *ten* per cent. may be used in the purchase of leases of *indifferent houses*, for such are liable to many *casualties*, as wind, rain, fire, and such like, so that no man will lay out his money upon such leases but he will have at least *ten per cent.* profit for his money."

Most other countries have, at some period of their history, found it necessary to limit the rate of interest. In 1228, the rate was fixed, at Verona, at 12½ per cent. per annum. In 1242, James I., King of Aragon, fixed it at 18 per cent. In 1270, the legal rate at Modena was 20 per cent. There is an edict of Philip Augustus, near this period (1272), limiting the Jews in France to 48 per cent.! In 1311, Philip IV. fixed the interest that might be legally exacted in the fairs of Champagne at 20 per cent. In 1336, the Republic of Florence borrowed money of individuals upon an assignment of taxes at 15 per cent., "which appears to have been above the common rate of usury." In 1490, at Piacenza, the rate was as high as 40 per cent. In 1491, the first public sanction by the Popes to the payment of interest was given. In 1545, Charles V. fixed the rate in the Low Countries at 12 per cent. In 1586, a law was passed in Scotland fixing the legal rate at 10 per cent. In 1773, the rate was fixed in Ireland at 6 per cent. by 14th George III. In the United States the limit was 8 per cent.

The limits fixed by legislative enactment offer no exact criterion of the rates actually existing in practice, although they undoubtedly exercise some influence. The *price of the Funds* is perhaps the best criterion in this country, and has been taken as such by the most experienced writers. They (the Public Funds) indicate the abundance or scarcity of money—are affected by war and peace—by national prosperity or adversity. The Funds may be termed the national thermometer—they register our successes and our disasters, our prosperity and adversity, scarcity and plenty. As the price of the Funds goes down the rate of interest rushes up. War and scarcity operate in this direction, and afford us another remarkable instance of the operation of the law of compensation. War and famine accelerate the rate of mortality, but they also improve the rate of interest, so that it is probable Assurance Offices with large funds realize, under such conditions, as much by excess of interest

on their investments as they lose by the excess of mortality in the shape of claims.

In 1829, Mr. John Finlaison wrote, "I take it for granted that it will be considered safe enough to assume that money, in a long course of years, will so accumulate through all fluctuations as to equal a constant rate of 4 per cent., because in point of fact money has hitherto accumulated at $4\frac{1}{2}$ per cent., whether we reckon from 1803 or from 1783."

Professor De Morgan, a little later, said, "assuming the necessity of calculating upon a rate of interest *something less than that which can actually be attained*, I should think that no Office would be justified in supposing more than 3 per cent., *with Tables sufficiently high to come any way near to the actual experience of mortality*." And in another place he says, the rate of interest assumed by Life Offices should "never be above that at which the Government can borrow" —namely, that regulated by the price of the Funds.

The causes of fluctuations in the Rate of Interest during different periods have constantly been discussed by political economists during the past fifty years. For example, the late Mr. John Stuart Mill gives us his views upon the conditions determining the Rate of Interest in the following passages:—"The disposable capital deposited in banks; that represented by bank-notes; the capital of bankers themselves, and that which their credit, in any way in which they use it, enables them to dispose of these, together with the funds belonging to those who, either from necessity or preference, live upon the interest of their property, constitute the general loan fund of the country: and the amount of this aggregate fund, when set against the habitual demands of producers and dealers, and those of the Government and of unproductive consumers, determines the permanent or average Rate of Interest." And again, "The Rate of Interest, then, depends essentially and permanently, on the comparative amount of real capital offered and demanded in the way of loan; but is subject to temporary disturbances of various sorts, from increase and diminution of the circulating medium; which derangements are somewhat intricate, and sometimes in direct opposition to first appearances."*

Professor Marshall, in his *Principles of Economics*, sums up the main causes in fluctuation as follows:—"The Rate of Interest, which was vaguely reported to be 10 per cent. during the Middle Ages, had sunk to 3 per cent. in the earlier part of the 18th century; but the immense industrial and political demand for capital raised it again, and it was relatively high during the great war. It fell as soon as the political drain had ceased, but it rose again in the middle of this century, when railways and the development of new countries made a great new demand for capital. These new demands have not slackened, but the Rate of Interest is again falling fast in consequence of the great recent accumulation of wealth in England, on the Continent, and, above all, in America."

* *Principles of Political Economy* (People's Edition), Book III., Chapter xxiii.

Another eminent authority on the subject, Professor Henry Sidgwick, sums up the conditions affecting the Rate of Interest as follows:—"By the Rate of Interest is meant the commonly expected average yield of newly-invested Capital, which, with certain qualifications, may be taken as approximately uniform in a modern community in a given time. It depends on the conditions of Demand and Supply combined—so far as Demand goes in a modern industrial society it depends mainly on industrial demand. It tends to correspond to the average additional produce expected to be obtained by the employment of the last increment of floating Capital *minus* 'Employer's Fee;' it therefore varies with the variations in recognized opportunities of profitably using capital to aid labour. The reaction of the changes in the Rate of Interest on the saving that supplies capital has an important but not definitely measurable tendency to keep the Rate stable. The yield of most—but not all—old Investments tends to decrease."*

The gradual fall in the Rate of Interest yielded on the Funds of Life Assurance Companies is, as may well be imagined, a subject that, during the last quarter of a century or more, has exercised the minds of Actuaries and all who are in any way concerned in the management of these institutions. It has been repeatedly discussed before the Institute of Actuaries and other similar bodies, and hence it will, we think, be of interest to our readers to know what are the views held by those who may be regarded as the leaders of the profession.

In the course of his Presidential Address to the Institute of Actuaries, delivered in 1884,† Dr. Sprague remarks:—"In considering the future of Life Assurance, there is no more important question than the Rate of Interest; and probably there is no question upon which greater differences of opinion exist, some authorities holding that the Rate of Interest must inevitably fall, while others take a more sanguine view, and think that so many new opening will continually be found for the safe investment of capital, that the average Rate of Interest may for long be considered at its present figure, at all events by those investors who are prepared to examine dispassionately the various new securities brought under their notice . . . . There is no doubt that the Rate of Interest yielded by Consols and other first-class securities has been steadily falling for many years. Mr. Babbage tells us that, with a view of getting an approximation to the average Rate of Interest in the country, he examined a period of 92 years of peace and war, commencing in 1731 and terminating in 1822. Taking the average price of Consols during each year, he finds that the average Rate of Interest they yielded was 4·1 per cent. during 48 years of war, and 3·48 per cent. during 44 years of peace, or 3·78 per cent. throughout. The average Rate of Interest yielded by Consols during the 66 years which have since elapsed, has certainly been less, until now it is a

* *Principles of Political Economy*—Summary of Chapter vi.
† *J. I. A.* xxv., p 79.

trifle under 3 per cent. But I am not satisfied that this is a trustworthy indication of what has taken place with regard to other good securities." Dr. Sprague then goes on to advocate the enlargement of the field of investments suitable for Life Offices, particularly mentioning the Colonies as offering higher returns for the investment of capital than is the case with British securities.

In 1887, Mr. David Deuchar delivered an address to the Actuarial Society of Edinburgh,* in which he referred to this subject in the following terms:—"The circumstance that the average Rate of Interest realized on the investments of Life Assurance Companies in 1837 was only £3. 12*s.* per cent., is scarcely in accordance with our preconceived notions. At present one hears so much about the fall which has taken place in the Rate of Interest, that it seems startling to find that the Rate realized fifty years ago was lower than that now earned by the funds of Life Offices. Further enquiry, however, shows the low average Rate in 1837 to be almost wholly due to the fact that the older and larger Companies then confined their investments chiefly to Consols and other Government securities, which yielded rates of 3 to 3½ per cent., with a small proportion of mortgages of the highest class, which yielded 4 per cent." Mr. Deuchar then proceeds to show from actual returns that between the years 1865 and 1885 the average Rate of Interest yielded by Life Assurance Funds has fallen only a quarter per cent., but at the same time observes that "the decline would certainly have been greater but for the movement which has been made by some of the Companies towards securing enlarged powers of investment, including permission to lend in the Colonies."

In a Paper read in November, 1896, before the Insurance Institute of Yorkshire, by Mr. Archibald Hewat, an investigation of a similar character is made with reference to the fall in the Rate of Interest. He also gives a Table showing the Rates of Interest realized by the Life Assurance Offices of the United Kingdom in different years. These Rates, which are estimated on a different and more accurate basis than that adopted by Mr. Deuchar, commence in the year 1870 and end in 1895. In the former year the average Rate was £4. 9*s.* 9*d.* per cent., and in the latter £4 per cent. "From this Table," he remarks, "it will be seen that the Rate has varied considerably, with a general tendency downwards, which is more apparent when exhibited in quadrennial groups. During the past eight years the Rates have averaged £4. 2*s.* 5*d.* against £4. 6*s.* 1*d.* during the preceding eight years, and they fall considerably below the Rates of 1870 and of 1875." In another Table, Mr. Hewat shows that the Rate of Interest yielded by Consols had fallen from £3. 4*s.* 10*d.* per cent. in 1870, to £2. 11*s.* 10*d.* per cent. in 1895, the greatest drop in the Rate taking place in the year 1889, when the nominal Rate was reduced from 3 to 2¾ per cent. He concludes that the secret of a low Rate of Interest is Peace and Prosperity, Riches and Security, and that, while we as a nation enjoy these in a

* *Transactions of the Actuarial Society of Edinburgh*, Vol. ii., No. 5.

remarkable degree in the closing days of the nineteenth century, so also do our Life Offices as financial institutions.

Having now considered the subject of the Rate of Interest historically, we will proceed to glance at it from a practical point of view, and to briefly illustrate its effect upon the various monetary transactions which form the basis of all Life Assurance calculations. Before, however, we can fully appreciate this effect, we must first of all understand the nature of *Compound Interest*, or Interest on Interest as well as on Capital.

We can best follow the operation of Compound Interest by tracing its effect year by year upon a fixed sum, say £100. This amount, when invested for one year at 3 per cent. interest, will at the end of that year have increased to £103; similarly, at the end of the second year it will have reached £106. 1*s.* 10*d.*; at the end of the third year £109. 5*s.* 5*d.*, and so on, till at the end of the twenty-fourth year the accumulated amount will be £203. 5*s.* 7*d.*, or a little more than double the original sum invested. This, however, it must be remembered, is merely a theoretical illustration, since in practice Compound Interest can only be realized on large sums, and not on shillings and pence. But if instead of £100 we had taken £10,000, the operation of Compound Interest would have followed precisely the lines of the illustration. It may be here mentioned that the period during which a sum invested at Compound Interest doubles itself may be found approximately by dividing the Rate of Interest into 70.* Thus at 3 per cent., as in the above illustration, this period comes out by this rule a little over 23 years. At 4 per cent. it is between 17 and 18 years, and at 5 per cent. a trifle more than 14 years. We may add that in the event of the Interest being payable and accumulating half-yearly or quarterly, the amount at the end of any period, for half-yearly payments, may be found by dividing the Rate by two and doubling the number of years in the period, and, for quarterly payments, by dividing the Rate by four and quadrupling the number of years.

In Life Assurance transactions, however, the operation of Compound Interest is observable almost entirely on a continuous investment of the principal; in other words, what we have to find is not the amount at Compound Interest of a fixed sum at the end of a specified number of years, but of an Annuity consisting of premiums at the end of such a period. This in its simplest form may be regarded for our purpose as the investment of £100 a year at Compound Interest. The amount of this sum at the end of the first year at 3 per cent. interest, will as before be £103; at the end of the second year, however, it will be £103 + £106. 1*s.* 10*d.*, or £209. 1*s.* 10*d.*; and at the end of the third year £103 + £106. 1*s.* 10*d.* + £109. 5*s.* 5*d.*, or £318. 7*s.* 3*d.*, and so on, till at the end of 42 years the total amount of the principal and that of

* This approximation was pointed out by Mr. M. N. Adler, in a short Paper read before the Institute of Actuaries in 1882 (*J. I. A.* xxiii., p. 359), in which he gives several other similar examples relating to Compound Interest.

the interest will be about the same—thus, principal £4,200, and interest £4,248. 7*s.* 10*d.**

In Appendix C to this work will be found a number of Tables showing at various Rates of Compound Interest the amounts of £1 and of £1 per annum at the end of any number of years up to 100, as well as the present values of the same sums payable either at the end, or during the period of, a similar number of years. These, we hope, will prove serviceable to many of our readers, since they can be applied to solve any problem involving only the element of Compound Interest. We have also added a set of Tables involving besides the element of Mortality—an element which of course in Life Assurance calculations is inseparable from that of Interest. It is with this element, either in conjunction with the element of Compound Interest or in its separate form, that we have to deal in the next few chapters.

* Should the reader desire to pursue the subject further, he may be referred to the Institute of Actuaries' *Text-Book*, Part I., and to Mr. King's *Theory of Finance*.

CHAPTER X.

THE RATE OF MORTALITY AND THE PRINCIPLES UNDERLYING THE CONSTRUCTION OF MORTALITY TABLES.

Having considered the operation of the Rate of Interest in the calculation of risks for the purpose of Life Assurance, we may now pass on to the consideration of the other element involved in such calculation, viz., the Rate of Mortality, which, in its simplest form, is represented by the probability of a person of a specified age dying in one year. In order to obtain a correct measurement of the Rate of Mortality, it is first necessary to obtain accurate statistics of the numbers dying and living for every year of life. This is effected by constructing what is called by some writers a "Life Table," and by others a "Mortality Table."

"If," says Dr. Farr, "we could trace a given number of children, say 100,000, from the date of birth, and write the numbers down that die in the first year, living, therefore, less than one year, against o in the Table, and on succeeding lives the numbers that die in the second, third, and every subsequent year of age, until the whole generation had passed away, these numbers would form a Table of Mortality, showing at what ages 100,000 lives become extinct. Again, if the 100,000 children were followed, and the numbers living on the first, on the second, and on every subsequent birthday, until none was left, the column of numbers would constitute a Table of Survivorship. So, if, of 100,000 children born at a given point of time, the numbers dying in each subsequent year were written in one column, and the numbers surviving at the end of each year in another column, the two primary columns of the Life Table would be formed."*

Of the principles upon which a Mortality Table should be constructed, and of its practical value in all calculations connected with Life Assurance, no better description has been given than that by Mr. G. M. Low, the distinguished Scotch actuary. "The business of Life Assurance," he says, "is founded on the principle that the number of deaths which will occur among a large number of persons in a given time is not a matter dependent entirely on what is called *chance;* but is subject to a law of average as uniform in its operation and so trustworthy as to its results as to be capable of forming the basis of calculation on which the shareholder may stake

* *J. I. A.* ix., p. 122.

his capital, and the assured the welfare of those for whom it is his duty to provide. Proceeding on this principle, Tables of Mortality have been constructed—from data collected at different places and under a variety of circumstances; and tabulated and adjusted with various degrees of accuracy—which show out of a given number of persons born, the number who die at each age from year to year. From such Tables Companies transacting the business of Assurance calculate the rates of contribution to be required from their clients, and on the sufficiency of the Rate of Mortality founded on in any instance depends of course the sufficiency of the premiums which the Company is to receive in consideration of its risks."*

The data from which a reliable Mortality Table can be formed, are mainly of two kinds—Census Returns and the Experience of Assured Lives. On the data derived from the former class, combined with the deaths recorded under the Registration Acts, were constructed the valuable English Life Tables of Dr. Farr and his successors Drs. Ogle and Tatham. Of the latter class the best exponent is the published experience of Twenty Life Offices, compiled under the superintendence of the Institute of Actuaries. The English Life Tables, which are now five in number, were based upon the deaths during a fixed period and a Census of the population, either, as in the first two Tables at the centre of such period, or as in the others at each end of the period. By this means an average number of deaths at each age per annum was obtained, as well as the average population, after making allowance for the normal increase of births and deaths and for immigration and emigration. In the Institute Experience the number of deaths was obtained from the registers of the contributing Offices; and from these, together with the numbers of entrants, withdrawals, and existing, at the close of the observations, were formed two columns—the Exposed to Risk and the Deaths for every age from 10 to 94. Having obtained the two primary columns of the Mortality Table, the next step is to form columns representing the probabilities of surviving a year and of dying in a year at each age. The latter is formed first by dividing the deaths by the numbers living or by the Exposed to Risk, the result being expressed as a decimal fraction, and this column being subtracted from 1 gives us the column representing the probability of surviving a year.

We are now in a position to apply these probabilities to constructing a hypothetical Table, such as that suggested by Dr. Farr. Assuming the starting-point, or *Radix*, as it is called, of such a Table to be 10,000 persons living at age 0, the numbers surviving each year at every subsequent age are obtained by multiplying those living at the preceding age by the decimal fraction representing the probability of surviving a year at that age. For example, if this probability is found to be ·8872 at age 0, to find the number of survivors at age 1 we have simply to multiply 10,000 by ·8872, which gives us 8872 as such number, the difference 1128 being the

* *J.I.A.* xviii., p. 195.

number of deaths occurring between ages 0 and 1. Similarly, if the probability of surviving a year at age 1 is ·9649, the number of survivors at age 2 is found by multiplying 8872 by ·9649, the product being 8561. Hence the number of deaths between ages 1 and 2 is the difference between 8872 and 8561, or 311. This process being repeated to the end of the Table, we have for each age the number of survivors out of 10,000 births, and also the number of deaths, the total of which must, of course, be equal to 10,000.*

From various causes, however, it will be found that these numbers of living and dying are of a very irregular character, and that the Table as it stands at present does not represent fairly the Law of Mortality which may be said to govern the human race. It is, therefore, necessary to apply to the Table a process called "Graduation," which is effected either by means of a mathematical formula or by what is known as the "Graphic Method." The principal methods of the former description are those which are associated with the names of their originators—Gompertz, Makeham, Finlaison, Berridge, and Woolhouse. The "Graphic Method" was adopted by Milne in his construction of the Carlisle Table, and has more recently been developed by Dr. Sprague, who applied it successfully to the Government Annuitants Experience (1883)†, The main distinction between the method derived from a mathematical formula and that applied by a graphical process, is that in the former a Law of Mortality is assumed and the facts made to bend as far as possible to that Law, while in the latter the reverse is the case. In the "Graphic Method," the computer first draws on cross-ruled paper a smooth curve representing approximately the series of values to be adjusted, and then amends it by successive trials till he is satisfied that the conditions of a good Graduation have been fulfilled. These conditions have been enumerated by Prof. McCay, an American actuary, as—(1) the general regularity in the rates; (2) the near agreement in the whole number of deaths; (3) the equality of the positive and negative deviations; (4) the smallness of the accumulated deviations; and (5) the frequency of the changes in their signs from positive to negative.‡ The great drawbacks to the "Graphic Method" are that the operator must be a skilled draughtsman, and that no two computers will obtain the same results, since its application is to a great extent a matter of judgment. It may be added that, generally speaking, the method employed for the graduation of a Mortality Table shonld be the one that most readily adapts itself to the series of observed facts for which the adjustment is required. Thus, Woolhouse's Method is suitable only where the observations are large in number and fairly regular in the death-rates. When the reverse is the case, then the "Graphic Method" is the best to employ. The principal objection to the graduation of observations which has been held by Prof. De Morgan and other eminent

* For a fuller treatment of this subject see *Text-Book*, Part II.

† Dr. Sprague has described this method very fully in a Paper read before the Institute of Actuaries in 1886 (*J.I.A.* xxvi., p. 77).

‡ *J. I. A.* xxii., p. 37.

actuaries, lay in the theory that the application of any process of adjustment deprived the original facts of their peculiar characteristics. This objection is, however, now fast dying out, and Graduation is becoming recognized as possessing a high scientific value.

Before leaving the subject of the construction of Mortality Tables, some reference must be made to a column which is usually added to the four already mentioned. This column is that which represents the "Expectation of Life," a term that simply means the average life-time which the number of persons living at a particular age will enjoy. The column is formed by summing the numbers living at all ages subsequent to the age for which the "Expectation" is required, dividing this sum by the number living at that age, and adding one-half or ·5. With the exception, however, of making comparisons between the death-rates in different Mortality Tables, for which, since it is but slightly affected by graduation, it is very suitable, the "Expectation of Life" is, for practical purposes, of but little value. Certainly no actuarial calculations are based upon it, as is commonly supposed. It applies, not to individuals, but to a body of persons of the same age; and to speak of the "Expectation" of a particular man as being a certain number of years, is to place a meaning on the term which it was never intended to bear and which accordingly is wholly fictitious.*

For Life Assurance Offices the uses of a Mortality Table are mainly two, viz., the computation of correct premiums corresponding to the benefits assured, and the periodical valuation of the liabilities under their contracts. Among other uses for which such a Table is necessary are the calulations upon which Surrender Values, Bonus Options, and the incidence of the mortality prevailing in a Company are based. For all these purposes a Table which only represents "aggregate" mortality is, at the best, but an imperfect instrument, since it fails to disclose an element which plays no unimportant part in the practical work of Life Assurance, this element being what is termed the "Effect of Selection." It has, for a long time, been recognized among actuaries, but more especially within the last twenty years, that it is not so much the age of an assured as the duration of an assurance that governs the rate of mortality among a body of assured lives. It has been pointed out by Dr. Sprague,† who is generally recognized as the greatest authority on the subject, that in this class there are three marked peculiarities. During the first two or three years the mortality is very light; after that period and throughout a great, and for assurance purposes, the most important period of life, it becomes unduly heavy; while in later years it shows signs of improvement. This fluctuation in the rate

* As an instance of the misuse of this term, we may refer to a lecture delivered at Gresham College, in 1889, by a well-known physician, in which he stated that on a man coming to him for examination for life assurance, say aged 30, he referred to a Table of Expectations of Life, and found that the proposer was likely to live another 34 years. He then made enquiries into the man's family, and perhaps found that all his relations had died at a comparatively early age, and from that he would conclude that he was not likely to live another 34 years, but about 24, and so he rated him up and regarded him as a person of 40, and charged him as much as if he had been 40.

† *J. I. A.* xv., p. 328.

of mortality is due entirely to the Effect of Selection, which can be exercised against an Office by an assured as well as against the assured by the Office. The latter takes place when the Office accepts, rates up, or declines a proposed life, and the former when he voluntarily withdraws from his part of the contract, either by surrendering his Policy or allowing it to lapse. It has also been shown* that in exercising an option with regard to a Bonus the assured is largely influenced by selection, since a man on his death-bed would hardly be likely to choose a Cash Bonus or a Reduction of Premium, when a Reversionary Addition of a much larger sum could be made to his Policy.

Various opinions have been expressed by actuaries as to the duration of the effect of selection. Mr. Spens held that it lasted for six years and then became exhausted. Mr. J. A. Higham, one of the earliest investigators into the subject, was of opinion that its duration was for a term equal to one-half of the difference between the age at entry and age 80. Mr. S. C. Thomson, in the course of an address on the subject to the Actuarial Society of Edinburgh, laid down the theory that "the good effects of selection continue to some extent throughout the whole duration of the Policies. A considerable portion of the benefits derived from it is certainly exhausted within the first few years after the gain made by eliminating all lives in actual bad health at the time of presenting themselves has been secured; but there is undoubtedly a further advantage of a somewhat more postponed character, which is acquired by weeding out persons of intemperate habits or of faulty family history or personal constitution, who may not die within five years or ten, but who, taken together, will live under their Expectation and prove a source of loss to the Office."†

The above opinions are, however, for the most part based upon a theoretical view of the subject. We will now give some views derived from actual experience. In the course of his work on "The Rate of Mortality of Assured Lives,"‡ based on the experience of the two Scotch Offices which contributed to the Institute of Actuaries' investigation, Mr. James Meikle remarks:—"The mortality during the first year of healthy lives is found to be very light, only about 43 per cent. of the entire average experience of assured lives. During the first two years it is about 72 per cent., and during the first three years about 74 per cent., and so on, gradually increasing with increasing age and with the increasing years of the assurance. It is found, moreover, that all lives do not show the same ratio of increase with the increasing years of assurance. Young lives show a more rapid increase of mortality than those whose constitutions are more developed and consolidated into riper manhood, and thus the benefits of selection endure longer on older than on younger lives." In his admirable Essay "On the Rate of Mortality

* See Paper on this subject by Mr. G. F. Hardy (*J.I.A.* xxiii., p. 1).
† *J. I. A.* xxi., p. 170.
‡ Published in 1872 by Blackwood & Sons (Edinburgh), and C. & E. Layton (London).

and Discontinuance among recently selected Lives," which Mr. James Chatham read before the Institute in 1891,* the author examines various Mortality Tables and analyzes the death-rate during the first ten years of assurance. His general conclusions are (1) that the advantage of selection diminishes at all ages with the duration of the Policy; (2) that it decreases very rapidly among those who are assured at the younger ages; and (3) that it decreases more slowly at middle life and among the older assured, and probably never entirely disappears. He further expresses his conviction "that in ordinary circumstances the rate of increase in the mortality during the ten years after insurance is independent of the rate of discontinuance."

Reference has already been made to the work of Dr. Sprague in connection with this subject. He, more than anyone else, has devoted an immense amount of time and labour to the investigation of the general law which prevails with regard to assured lives whether "select" or otherwise. In 1876, he first published Tables of Premiums for "select" lives, based upon the Institute Experience,† and, five years later, in the second part of an elaborate Paper dealing exhaustively with the whole question,‡ he gave an additional set of Tables analyzing the mortality in each of the first five years of Assurance which he compared with that subsequently experienced. He also showed the value of such Tables as having a most important bearing upon various points of Life Assurance Finance. Again, in the course of a Report to the Treasury on the subject of the construction of the Government Annuity Tables (1883), he refers to the "Effect of Selection" in the following terms:—"This subject has been principally studied in connection with the mortality experience of Life Insurance Offices. The medical examinations and the precautions taken have the result of eliminating from the general body of persons whose lives are proposed for Insurance almost all those individuals who are suffering from a disease likely to cause early death, as well as persons whose habits are so intemperate that they are likely to die prematurely; and the effect of this is that the rate of mortality among recently insured lives is greatly below the normal mortality corresponding to their ages. The difference is greatest in the year immediately following the date of the Insurance, and becomes gradually less in each succeeding year, until, after the lapse of an interval which is variously estimated, it disappears, and the normal rate is attained. It seems probable that a similar effect will be found to exist whenever a body of lives is recruited according to any law, that is to say, by the introduction of fresh lives not taken at random. For example, it has been shown that the rate of mortality among married men is very much lighter than among bachelors of the same ages, obviously for the reason that the great majority of men who marry are in good health; and the majority of those men who are in bad health do not

* *J. I. A.* xxix., p. 81.
† *J. I. A.* xx., p. 95.
‡ *J. I. A.* xxii., p. 391.

marry. . . . The investigations that have been more recently made into the mortality among insured lives, have shown that the effect of selection is of sufficient importance to require to be taken practically into account." In 1896 the Institute of Actuaries published a volume of "Select Life Tables" containing the results of Dr. Sprague's labours in this direction.

In subsequent chapters, when discussing Life Assurance in its financial aspect, we shall recur to this important subject.

CHAPTER XI.

MORTALITY TABLES—THEIR HISTORY AND DISTINCTIVE FEATURES.

We have already traced the beneficial influence which the construction of the earlier Mortality Tables produced, not only in facilitating the progress but in improving the practice of Life Assurance Societies—forming, in fact, epochs in the history of the progress of Life Assurance. We have seen how, at the beginning of the 17th century, lists of deaths were periodically published, called "Bills of Mortality," and how, from these records, the germ of a Mortality Table was developed by Captain John Graunt and subsequently matured into a shape possessing the elements of scientific precision by De Witt in the Netherlands and by Halley in England. Of the value of the respective labours of these two pioneers of actuarial science, Mr. W. T. Thomson thus writes :—"Dr. Halley may be designed, then, the discoverer and scientific arranger of what are called Life Tables; but there is no doubt that De Witt preceded him by some years in the elimination of a method by which the true value of a Life Annuity could be obtained. Halley was more scientific than De Witt; but there is no occasion to place the one above the other—they both made important discoveries and valuable additions to our knowledge, and, without clashing, they may be referred to as the originators of the application of the doctrine of probabilities of life and death to practical uses."*

Another distinguished Actuary, Mr. T. E. Young, in the course of a Presidential Address to the Institute of Actuaries, speaks as follows :—"Our British investigator, Dr. Edmund Halley, expounded for the first time in 1693 the necessity of the Conception of Age in the preparation of the Breslau Table as a classification of facts. In the compilation of the Bills of Mortality in this country—commenced as a late sequel to the General Visitation of Religious Establishments in 1538, and fitfully continued until their formal organization into the General Register Office of 1836—the ages were omitted, and it was not until John Smart, with similar insight, enlarged upon the defect in 1726, that in 1727-8 this element was included. The illustrious Grand Pensionary, Johan De Witt, again, presented his Report on Annuity calculations to the States-General of Holland and West Friesland at the earlier date of 1671, in which the results were

* Treatise on Life Assurance (1856).

based upon the ages recorded. Thus, at the earliest period of our systematic history, this governing conception of Age in the tabulation and employment of statistics was distinctly recognized in consonance with approved scientific method."*

In the days when "wagering Assurances" were at their height, it was of importance to the policy-mongers to know not simply the Expectation of life, but also the "odds" or chances of life against death at various ages. These Halley, in addition to Annuity Values, deduced from his Mortality Table. His plan was to divide the number of persons remaining after the age of any individual life by the difference between that number and the number living at the age to which it is proposed he should live. As his Tables stated 567 out of 1,000 persons to be living at the age of 25, and 560 at the age of 26, a person of the former age had the chance of 560 to 7, or 80 to 1, that he would not die within the year. Again, for ascertaining the chance that any person would not die before he should arrive at any given age, he divided the number of persons living at that age by the difference between that number and the number living at the present age of the individual. For example, by his Table the number living at age 40 was 445, and at age 47 the number was 377, the difference being 68. Hence, to determine the chance that a person aged 40 would live 7 years longer, he divided 377 by 68, and thus obtained as the "odds" $5\frac{1}{2}$ to 1.

It was probably with Halley's Table before his mind that Addison introduced into his "Vision of Mirza" his well-known allegory of the bridge consisting of three score and ten entire arches, together with a number of broken arches which made the total a hundred. This bridge represented Human Life, and each arch the period of one year. He describes the multitudes passing over the bridge and falling into the flood below, either through trap doors, which were thickly laid at each end of the entire arches, but grew thinner towards the middle, or, after the entire arches were ended, through the cavities in the broken arches.

At an interval of some thirty years after Halley developed his theory of the Law of Mortality, De Moivre published his "Treatise of Annuities on Lives," where he enunciates his famous Hypothesis of equal decrements, which he tells us "consists in supposing that the number of lives existing at any age is proportional to the number of years intercepted between the age given and the extremity of old age." Starting with age 12, at which 74 persons were supposed to be living, he assumed that, during each succeeding year of life up to age 86, one person died, the number living at any particular age being, of course, the difference between 86 and that age. De Moivre was followed by Thomas Simpson, whose work in this direction has already been described. His rule for finding the value of an annuity on three joint lives by means of Tables of Annuities on single lives and on two joint lives, which is known as "Simpson's Rule," has since been modified by Dr. Price, Milne, and Mr. James Meikle.

* *J. I. A.* xxxiii., p. 105.

Of Simpson, Mr. Young, in the Address already referred to, says that he "appears to have been the first writer who avowedly attempted to devise a universal system of procedure, accompanied by a general notation, without restriction to the incidents and peculiarities of any specialized class of observations."

We have at last reached a period when the science of the Law of Mortality and its application to the calculation of the contingencies affecting human life began to be more perfectly understood. With the publication of Dr. Price's work on Reversionary Payments, in 1771, which contained the first Northampton Table, may be said to commence a new era, this being the first Mortality Table recognized and adopted as a basis for the purpose of calculations for Life Assurance. It was followed by other Tables which have been used for similar purposes at various times during the nineteenth century. The most important of these Tables, with the methods of their construction, their distinctive features, and the uses for which they were best adapted, will now be briefly described. As has been previously remarked, the data upon which such Tables were based, are mainly those derived either from Census Returns or from the Experience of Assured Lives. In the former category are comprised the Northampton, Carlisle, and the different English Life Tables; in the latter the Tables of the *Equitable*, *Amicable*, and numerous other individual Offices, as well as those constructed from the combined experience of Life Assurance Companies, such as the "Seventeen Offices'," the "Institute of Actuaries'," and the "Thirty American Offices'" Tables. To these Tables, another, which cannot be said to come strictly within either of these classes, viz., the Peerage Table of Messrs. Bailey & Day, has been added.

NORTHAMPTON TABLE.

The history of this Table, which is the earliest known to have been used for the purpose of calculating Rates of Premium for Life Assurance, is a remarkable one. Dr. Price, the compiler of it, formed two distinct Tables based on the accounts of the ages at death of persons who had been buried in the parish of All Saints, Northampton. The first of these Tables, which is given in the first three editions of his work on Reversionary Payments, was deduced from 3,690 deaths during the 36 years 1735-70. The second Table, which may be considered as *the* Northampton Table, was based on the number of deaths during the 46 years 1735-80, which was 4,689. In constructing this Table, Dr. Price started with a radix of 10,000 births. He assumed, quite erroneously, that, because the number of burials slightly exceeded the number of christenings—a circumstance mainly due to the presence of a large proportion of Baptists in the town—the population had for a long time been stationary. He further assumed, that, at age 20, the inhabitants were increased by about 13 per cent., owing to immigration from the neighbouring country districts. In accordance with these assumptions, he deducted

this percentage from the radix of 10,000, and made it 8,700, a deduction of 1,300 being also made at every group of ages up to age 20, which, from 5,135, was reduced to 3,835. He then raised these reduced numbers in the proportion of 5,135 to 3,835, the new radix thus becoming 11,650, and the numbers living at ages subsequent to 20 remaining practically unchanged, with the exception of such adjustment as was caused by the decrements at ages 20–30 and 30–40 being made equal.

In the Appendix to the Eighth Report of the Registrar-General, the late Dr. Farr discusses at great length the method by which he considered these Tables were compiled, points out the errors both in the assumed basis and the mode of construction, and compares the Rates of Mortality deduced by Dr. Price with those brought out by a Table of his own based on the deaths in the same parish during the period of 1838-44, and on the population in the year 1845. Mr. Sutton, however, in his Paper on the subject, read before the Institute of Actuaries in 1873,* shows the actual method pursued by Dr. Price, to whom he thinks Dr. Farr has not done sufficient justice.

The general effect of the application of this Table to the calculation of Rates of Premium for Assurances in this country—especially at the younger ages at which Policies are usually granted—was to create great injustice, such rates, owing to the heavy Rate of Mortality brought out by this Table, being far more than necessary. "By its use," says Dr. Farr, "the Proprietary Offices have exacted enormous and unequal Premiums from the portions of the community who happened to be ill-versed and ill-instructed in the intricate science of Life Assurance." In other parts of the world, however, such as the West Indies, where the death-rate is much higher than in this country, it has been found that the Northampton Table fairly represents the mortality experienced, and up to a comparatively recent period the *Barbadoes Mutual* Life Office, which in this region is supreme, based all its calculations—whether for Premiums, Valuations, or Surrender Values—upon this Table. It should be added, that, although the Rate of Mortality shown by the Table is excessive, the Reserves brought out by its use in Valuations are very inadequate.

In 1808, when Government Life Annuities were first established as part of a scheme for the repayment of the National Debt, Mr. Morgan was consulted by the Treasury as to the computation of the Tables. He, not unnaturally, computed them upon the same basis as he had adopted for his own Office. In 1819, however, Mr. John Finlaison, in the course of an elaborate Report to the Chancellor of the Exchequer on the subject, directed his attention to the ruinous loss sustained by the Government in thus granting Life Annuities at prices immensely below their value. Eight years later a Committee of the House of Commons made an investigation into the matter,

* *J. I. A.* xviii., p. 107.

with the result that Mr. Finlaison's Report was fully confirmed; but before the error was rectified about two millions of money had been lost to the country.

CARLISLE TABLE.

This Table was constructed by Mr. Joshua Milne, in 1815, from data supplied to him by a resident physician, Dr. Heysham, which exhibited the population of the Parishes of St. Mary and St. Cuthbert, Carlisle, in 1780 and also in 1787, as well as the number of deaths which had taken place at quinquennial groups of ages in the same two Parishes during the nine years 1779-87. The total populations in each of the two years under observation were 7,677 and 8,677 respectively, and the total number of deaths during the interval 1,840. In order to form his Life Table, Milne added together the results of the two Censuses and multiplied the sum by four, this being equivalent to the sum of the average population in each of the eight years covering the observed period. He then, in order to obtain the corresponding number of deaths during this period, deducted one-ninth from the total number recorded in nine years. His next step was to graduate his data: this he did by erecting on cross-ruled paper two rectangles representing by their areas the above populations and deaths respectively. Through these rectangles he drew curved lines, so as to obtain by a graphical process of graduation a fairly even series of adjusted observations for every year of age. The details of this process are so fully and clearly set out by Mr. George King in his Paper on "The Carlisle Table," read before the Institute of Actuaries in 1883,* that it is unnecessary to repeat them here.

Owing to the limited number of observations upon which it is based, to its faulty graduation, and to the insufficient reserves which it brings out, the Carlisle Table has been the subject of much adverse criticism. At the time, however, when it was published, it was a vast improvement upon any existing Table, and in his "Essay on Probabilities," written in 1838, Professor De Morgan pronounced it to be the best existing Table of Healthy Life which had been constructed in England. Milne himself considered that, though it had been constructed from the Mortality of two Parishes only, the results it exhibited would probably vary very little from the general law that obtains throughout the Kingdom, taking towns and country together, if we except "the children under five years of age, or at most under ten." One characteristic of the Table, which makes it unsuitable for the use of Life Offices, is that in the original observations the proportion of females to males is 55 to 45, whereas, in Assured Life Experience, females form, as a rule, only ten per cent. of the total number of lives. It has, however, been shown that the Rates of Premium brought out by this Table very closely approximate to the correct ones, and hence those Offices which have based their

* *J.I.A.* xxiv., p. 186.

rates upon it, have, as a rule, seen no reason to alter them. For Valuation purposes, on the other hand, the Table is gradually becoming obsolete, its use being confined to a few minor classes of risks, and to annuity values in reversionary transactions.

EQUITABLE SOCIETY'S EXPERIENCE TABLES.

From this Experience a number of Tables appear to have been constructed at different times during the present century, the best-known being those of Mr. Griffith Davies and Mr. Arthur Morgan, called respectively Davies' Equitable and Morgan's Equitable Tables. The chief interest in these Tables arises from the fact of their being the first Mortality Tables constructed from the records of Assured Life as distinguished from the lives of Annuitants—tontine or otherwise. In 1825, Mr. Davies, who was then Actuary of the *Guardian*, published a Table constructed from a comparison given by Mr. Wm. Morgan in his edition of Dr. Price's works, between the decrements in the Northampton Table, and those in the *Equitable* Society between the years 1768 and 1810, with the result that it was found that in every period of life the probabilities of living were higher—and consequently the number of deaths smaller—in the Society than those by the Northampton Table upon which the Premiums had been based, and that, taking the aggregate ages, these probabilities were in the proportion of three to two. Davies assumed the existence of two communities, formed by the admission of 2,844 new entrants of the age of 10 at the beginning of each year for any period not less than ten years, none withdrawing except by death. To one of these communities he applied the Rate of Mortality by the Northampton Table, and to the other that of the Society's actual experience. "Davies' Table," observed the late Mr. A. G. Finlaison in 1860, "was derived from the factitious experience of the *Equitable* Society disclosed by the late Mr. Wm. Morgan in his edition of Dr. Price's works. This factitious experience consisted mainly of the ratio which the decrements of life in the *Equitable* Experience bore, at certain ages, to those decrements given in the Breslau Table of Mortality. Davies raised an immense superstructure of calculations in Tables of the values of single or joint-life Annuities at many rates of interest on this small foundation; but these computations, which, notwithstanding their origin, make a near approach to truth, and form for some purposes a highly useful system of Tables, are also based on a combination of the two sexes."

Three important characteristics which appear in this Table have been pointed out by different authorities. The late Mr. J. A. Higham, as the result of his investigation into the "Effect of Selection," some 50 years ago, concludes that this Table is more suitable for the calculation of Premiums than any other in common use. In 1871, Dr. Sprague declared that a Net Premium Valuation by this Table produced smaller reserves than any other known Table. This opinion is to some extent confirmed by Mr. George King

in the valuation of his "Model Office" by different Tables, the Northampton Table being, however, placed by him on a still lower level. The third characteristic of the Table is the high value it brings out for Annuities. In the summary of proportionate reserves required by different Tables for this pupose, given by Mr. G. H. Ryan in the course of a Paper read before the Actuarial Society of Edinburgh in 1885,* it appears that those by Davies' Table are 98·8 per cent. of those by the Government Experience (1883) Table, the Carlisle and H^M Tables following with 95·9 and 90·3 per cent. respectively. This Table, it should be added, has held for a long period a very high reputation, chiefly on account of its excellent graduation and of its close correspondence with the Carlisle Table.

The Table constructed by Mr. Arthur Morgan, the Actuary to the *Equitable*, and published by him in 1834 for the use of the members of the Society, was based upon much sounder principles than that of Mr. Griffith Davies, and was, at the same time, of a far more elaborate character. The observations extended over 66 years, from the foundation of the Society in September, 1762, to the 1st January, 1829. The total number of lives observed was 21,398, of whom 9,324 had discontinued, 5,144 had died, and 6,930 were in existence at the close of the observations. The total number of years of life observed was 252,708, and the average duration of each policy was accordingly nearly 12 years. The observations were tabulated in such a manner as to show the numbers in each of these three classes for every year of assurance at each age of entry. By this means a comparison of the rates of mortality at different periods after the date of entry could easily be made, and it was on this Table that Mr. J. A. Higham made his investigations into the "Effect of Selection." This Table was also carefully graduated, but by a different method than that adopted by Mr. Davies.

AMICABLE SOCIETY'S EXPERIENCE TABLE.

This Experience was deduced by Mr. Thomas Galloway and published in 1841. It extended over 33 years, commencing in 1808, the period being, it will be noticed, only half that covered by the *Equitable* Experience. The observations, which were 3,530 in number, and nearly all males, were divided into two classes—members assured up to the end of 1808 and those assured subsequently. "This distinction," observes the late Mr. Samuel Brown, "is especially valuable, as not merely confirming the previous observations, but as showing, amongst the older class, the mortality of a Society in which nearly all the members had become extinct; less than six per cent. of those who were living in 1808 remaining alive at the date of observation. . . . The combination of the two classes shows a mean duration of life, at nearly all ages, less than that of the *Equitable* Society, especially between the ages 40 to 60; and above the age of 55 to near 80, less than that of the Northampton

* *Transactions*, Vol. i., p. 120.

Table."* Of the total number of entrants, 505 had discontinued, 798 had died, and 2,227 were in existence at the close of the observations. In the course of a brief description of the method adopted by the author in arranging the observations, Mr. Whittall remarks—"Mr. Galloway avoided the introduction of a double assumption, involving uncertainty both as to the fractional periods of Experience in the year of entry and the fractional periods by which the entrants fell short of their next birthdays. He eliminated the former element by adopting the policy-year principle and observing the lives through each anniversary of the Assurance; but, as regards the age, he was obliged to make some assumption, and he adopted the now usual one, that each life fell short of the age next birthday by six months."†

It has been found, on comparing this Experience with that of the *Equitable*, that the former is less favourable to life than the latter. Professor De Morgan attributed this circumstance to the fact that the latter Society was much more careful in the selection of its lives than the former during the earlier period of its existence. The later years of the *Amicable*, however, do not exhibit any very decided difference of this kind. As has been already mentioned, the business of this Society was, in 1866, transferred to the *Norwich Union*.

SEVENTEEN OFFICES' TABLE.

In this Table we have the earliest Experience relating to a combination of Life Offices. It was undertaken in 1838, when seventeen of the principal Offices, which included the *Equitable*, *Amicable*, *Guardian*, *London Life*, *Scottish Widows*, and *Sun*, contributed their Experience. The data were collected and arranged under the superintendence of a Committee of Actuaries, which availed itself of the most extensive and special Experience that could be obtained to determine the Law of Mortality prevailing amongst assured lives. The total number of observations was 83,905, these being upon Policies, not Lives. For very young and old ages the facts were few, so that no great reliance can be placed upon the final results at these ages. After age 80 the results were obtained by assuming the Expectation of life at that age to be $4\frac{3}{4}$ years. A method of Graduation was applied to the observations by Mr. Woolhouse, the effect of which was to exhibit the probability of dying in a year as slightly less than that by the Carlisle Table at ages below 50, but greater at the higher ages, as well as to give to Policies valued by this Table somewhat higher reserves than by the Carlisle Table. In its computation several curious and unexpected results were elicited. First, the Table showed that the mortality from "town" life, taking all ages, was more favourable than that from "country" life. Secondly, it was found that the mortality amongst assured females was greater than amongst assured males. Thirdly, the mortality amongst Irish

* *J. I. A.* ii., p. 200.
† *J. I. A.* xxxi., p. 168.

lives proved to be greater than amongst English lives, either "town" or "country." This last result was subsequently discovered to have arisen from the fact that systematic frauds had been carried on in the Emerald Isle, through which, by means of personation, intemperate and other under-average lives had become assured, the Gambling Act not being extended to that country till the year 1866. The observations were restricted to the first 23 years of the existence of the Offices, the average duration of each Policy being only $5\frac{1}{2}$ years, and hence, as a means of illustrating the increase of mortality after the effect of Selection had worn off, they are less valuable than those in the *Equitable* and *Amicable* Tables, the Experiences of which extended over a considerably longer period of time. The total number of Policies in which the sexes were distinguished was 40,616, of which 25,462 were in existence at the close of the observations, 11,226 had been discontinued, and 3,928 had become claims by death. The proportion of female lives was only 10·3 per cent. of the whole number. Under the First Schedule of "The Life Assurance Companies Act, 1872," as well as by an Act passed in 1873 by the Legislature of New Zealand, this Table has been made the standard for determining the rate of mortality for valuing Policies in a Company about to be wound up. The Table, it may be added, notwithstanding this statutory recognition of its value, has never been published in this country, a small number of copies only having been printed for private circulation. In the United States, however, where this Table is still held in high esteem under the title of "The Actuaries' Table," the late Hon. Elizur Wright, who was the first Insurance Commissioner of the State of Massachusetts, published at Boston in 1871 some Valuation Tables at 4 per cent. Interest, based upon this Experience.

INSTITUTE OF ACTUARIES' TABLES.

These Tables, the unadjusted results of which were published in 1869, were based upon the Experiences contributed by Twenty Life Offices—ten English and ten Scottish. The whole work of obtaining, arranging, and tabulating the observations contained in this "Combined Experience," which closed on 31st December, 1863, was undertaken by a Committee appointed by the Council of the Institute of Actuaries. These observations, which were on lives, not on Policies as in the Seventeen Offices' Table, and from which duplicate Policies were carefully eliminated, were divided into four main Sections—Healthy Males (H^M), Healthy Females (H^F), Healthy Males and Females ($H^{M\,F}$), and Diseased Males and Females ($D^{M\,F}$), the total number of lives observed being 160,426. Of this number, 130,243 belonged to the H^M Table, 16,604 to the H^F Table, 11,146 to the $D^{M\,F}$ Table, while 2,433 lives were separately dealt with on the ground of having been rated up for the extra risks of climate or occupation. It will be thus seen that the H^M Table has by far the largest proportion of observations, and hence the results produced by

this Table have long been recognized as the best criterion at present existing for testing the incidence of the mortality prevailing amongst assured lives. In this Table the number of withdrawals was 35,024, of deaths 20,521, and of existing at the close of the observations 74,698; the years of life observed amounted to 1,190,140, and the average duration of each Policy was 9·13 years.

In all the unadjusted Tables a radix of 10,000, starting at age 0, was adopted, and the Experience was tabulated according to Calendar years—a method which has since met with much adverse criticism. Owing to the difficulty in many cases of obtaining the exact date of birth of the assured, it was assumed that all lives were born on the 30th June. It was further assumed that the lives entered in the middle of the Calendar year, this year being called year 0 of Assurance, and being consequently only half a year. To the H^M and H^F Tables an ingenious method of Graduation was applied by Mr. Woolhouse with very satisfactory results. The value of the former Table was also greatly enhanced by the elimination from it of all lives which had been under observation more than five, or strictly speaking, four-and-a-half years, the object being to show the increased rate of mortality consequent upon the assumed exhaustion of the "Effect of Selection." A new Table, known as $H^{M(5)}$, was thus formed, consisting of 65½ per cent. of the lives in the H^M Table, and has been employed to a great and increasing extent of late years in the valuation of Policies more than five years in force. For other Policies the H^M Table is at present the standard for purposes of Valuation, Distribution of Surplus, and comparing the incidence of the Mortality Experience with that expected. A combination of these two Tables is, as far as the rate of mortality is concerned, the most stringent basis of Valuation in existence. As Dr. Sprague has observed, the publication of the H^M and $H^{M(5)}$ Tables may be considered as forming an epoch in the history of Life Assurance, since they clearly show that the rate of mortality experienced in assured life is greatly influenced by the duration of the assurance. In both these Tables, as well as in the H^F Table, the graduated results start at age 10 with a radix of 100,000, the observations at the lower ages being excluded owing to the smallness of their number.

In addition to the above Experience, a separate investigation into that of the ten Scottish Offices was made under the superintendence of the Faculty of Actuaries in Scotland, and the results, upon which, however, no monetary Tables were based, published in the form of an elaborate Paper, read before the Royal Society of Edinburgh by Mr. James Meikle on 7th March, 1870. In this Experience the observations included 82,334 Healthy Males, 8,864 Healthy Females, and 3,551 Diseased Males and Females, the total number of deaths in each of these sections being respectively 10,646, 1,301, and 496. In the two classes of Healthy Lives the proportion of the deaths was 13·1 per cent., of the withdrawals 20·4 per cent., and of the existing at the close of the observations 66·5 per cent.

In 1893, the Institute and Faculty of Actuaries respectively

appointed a Joint Committee for the investigation of the Mortality Experience of Life Assurance Companies in the United Kingdom for the thirty years ending 31st December, 1893. In response to a circular issued by this Joint Committee, 63 British Companies agreed to contribute their Experiences of Assured Lives, or of Annuitants, or of both classes, while three American Offices undertook to contribute their Annuity Experiences.* From 1896 to the present year, a large staff was continuously employed at Staple Inn Hall in classifying the Cards upon which the various Experiences were recorded, and in preparing the necessary elementary Tables. Some idea of the enormous amount of labour involved in this process may be gathered from the fact that the Annuity Experience was recorded on 32,000 Cards, of which 9,000 related to Males and 23,000 to Females—the latter thus forming about 72 per cent. of the total facts; and that the Experience of Assured Lives was contained upon upwards of 1,100,000 Cards, of which over 1,000,000 related to Males and over 80,000 to Females—the latter thus forming about $7\frac{1}{2}$ per cent. of the total Experience. It should be added that special means were adopted for the treatment of duplicate Policies, while those on Rated-up lives and on the lives of naval, military, and seafaring men, as well as certain special classes of Assurance were altogether excluded.†

AMERICAN EXPERIENCE TABLE.

This Table, which was based partly upon the Experience of Assured Lives in the Mutual Life Insurance Company of New York and partly on previous Tables, was compiled by the late Mr. Sheppard Homans—the distinguished American Actuary—and published by him in 1867. Its origin and the imperative necessity for the construction of such a Table have been thus described by Professor C. F. McCay:—"When our Mutual Life Companies began their Life business in 1843, they had no American Table of Mortality to guide them in determining the Premiums of Insurance that ought to be charged at the different periods of life. There were no American statistics, public or private, good, bad, or indifferent, to which they could refer, except the mortuary reports of cities, and these were so imperfect and unreliable as to be utterly useless, except to encourage the opinion that the chances of long life were about the same here as in the countries from which our people emigrated. . . Under these circumstances, the Companies very naturally turned their inquiries to the English Tables of Mortality. The British Offices

* See Appendix D.

† The following volumes of Tables based upon the data thus collected either have been already published, or are in course of publication, by Messrs. C. & E. Layton:—

Combined Experience of Life Annuitants:
Male Lives and Female Lives.
Combined Experience of Assured Lives
(Endowment Assurance and Minor Classes of Assurance):
Male Lives and Female Lives.
Combined Experience of Assured Lives (Whole-Life):
Male Lives.
Combined Experience of Assured Lives (Whole-Life):
Female Lives.

which had followed these had been successful and prosperous. Those who had used the high rates of the Northampton had done a profitable business; and those who had trusted to the low rates of the Carlisle had done well. The similarity between the people and the climate, and the habits and condition of our population and that of Great Britain was so great, that they concluded that our rate of mortality could not differ much from the English. . . . As the Actuaries' Table was only published in 1843, and Dr. Farr's No. 1 in the same year, their choice was limited. They all selected the Carlisle, as it was more recent than the Northampton, and more esteemed by English Actuaries, because its general results had been strongly confirmed by the Experiences of the *Equitable* and *Amicable* Insurance Companies, which were the oldest and largest in Great Britain. . . . Their premiums were irregular, loaded more at one age than at another, and did not conform exactly to any Life Table. They were probably taken from some English Company which had modified the Carlisle rates at particular ages according to its own Experience, or according to some fanciful theories of its officers. . . . These defects in the early premiums were, for the most part, soon corrected; and especially did the oldest and largest New York Company take an active and commendable part in this improvement. Their Actuary, Mr. Gill, constructed an average Table from the Actuaries', the Swedish, and other good Tables, and a set of 'commutation columns' were deduced from this, which were used for premiums and reserves, and valuations and dividends."

Mr. Gill's successor at the *Mutual of New York*, which is the Company referred to by Professor McCay, was Mr. Sheppard Homans. This gentleman in 1859 constructed a Mortality Table based upon the 15 years' Experience of the Company, the general results of which conformed pretty nearly to the Experience of the English Life Offices. This Table was followed, in 1867, by the "well-adjusted, admirably constructed" "American Experience Table," which was adopted first by his own Office and afterwards by the State of New York as the Official Standard Mortality Table. It has since been made the basis of all New York Companies not only for the calculation of premiums but for valuations and the distribution of surplus. This Table shares, with that of the Combined Offices' Experience Table, the honour of being the standard adopted by a large number of the States of North America.

THIRTY AMERICAN OFFICES' TABLE.

The Experience, upon which the elaborate Tables issued in 1881 were constructed under the superintendence of Mr. Levi W. Meech, is, up to the present time, the largest ever published. As its title indicates, it was contributed to by thirty Offices in the United States, the Experience extending over a period of thirty years up to the end of 1874. Like those of the Seventeen Offices' Experience,

the observations were on Policies, the total number of which were 1,027,529, 982,734 being on the lives of males, and 44,795 on the lives of females. The total number of years' of life observed was 4,304,843·5, and the average duration of each Policy 4·38 years. The Experience, which differed from similar investigations of the kind conducted in this country by being based not upon lives but upon amounts assured, was tabulated by the same method as that adopted by the Institute in its Experience, with the exception that the ages were taken as those at the nearest birthday instead of those next birthday. Though it is not clear from the Tables as to whether rated-up lives, or those exposed to extra risk in any form, have been included, and, if so, how they have been treated, the fact remains that the rate of mortality at ages 25 to 30 is higher than the short duration of the majority of the Policies observed would seem to justify. A novel feature introduced into this Experience is the continuation of the observations on the "existing," which formed more than 50 per cent. of the entrants, by means of a method described as a "Final Series," the deaths and discontinuances being allotted proportionately among this class of Policies, on the assumption that the same rates of mortality and withdrawal would prevail among these Policies as had occurred in the actual Experience. Of this method, the effect of which was unquestionably to increase the rate of mortality throughout the Table, Mr. Meikle remarks that "it is very ingenious, but I doubt the advantage of such a process of forcing statistics." Dr. Sprague also criticises this method in the following terms—"Although this method removes one objection, it leaves untouched the far more serious one above indicated, inasmuch as it still assumes that all persons of the same age are subject to the same rate of mortality, and neglects the difference in the rate of mortality arising from the difference in the length of time since entry."* The Experience showed that in America there appeared to exist a heavier rate of loss than of mortality, the larger Policies being less profitable than the smaller—a condition of things which is the reverse of what is generally believed to prevail in this country.

ENGLISH LIFE TABLES.

The Mortality Tables, known by the above title, are five in number, the first three having been compiled by the late Dr. Farr, the fourth by Dr. Ogle, and the fifth by Dr. Tatham, all of whom have been successively Superintendents of the Statistical Department of the General Register Office, Somerset House. Their origin was due to the energy and wisdom of Dr. Farr, who, seeing the necessity for a Table based upon the Census Returns and the deaths registered every year since 1st July, 1837, when the first Registration Act came into operation, set to work to collect and arrange the requisite data upon which such a Table as he had in view ought to be constructed.

* *J. I. A.* xxiv., p. 294.

Table No. 1 was based upon the Census Returns and the deaths registered in England and Wales during the year 1841, the population in the middle of such year being estimated at 15,927,867, and the deaths 343,847. It was published in the Fifth Annual Report of the Registrar-General issued in 1843. The objections to such a use of the Mortality Returns for a single year are obvious, but, notwithstanding this, it has been found that the rates of mortality in that year were of a fairly average character, and that the general results of this Table are in remarkable agreement with those yielded by the two subsequent Tables, which had the advantage of a more extended series of observations.

Table No. 2 was based upon the same Census Returns as No. 1, certain corrections being made in the population which was increased to 15,929,834. The deaths, however, covered a period of seven years, viz., 1838 to 1844 inclusive, and were 2,436,648 in number. This Table was published in the Twelfth Annual Report of the Registrar-General. dated 10th January, 1853.

Table No. 3 was of a far more extensive and complete character than either of the other two. The data employed for its construction were the Census Returns for the years 1841 and 1851, and the deaths registered during the period 1838 to 1854 inclusive—17 years. The mean populations for these two years were 15,929,492 and 17,982,849 respectively, the former population having received a still further correction since the publication of Table No. 2. The deaths during the period observed numbered 6,470,720. The various Tables relating to this Experience, which were published first as a separate volume by the authority of the Registrar-General in 1864, and three years later in the 28th Annual Report of the Registrar-General, were all calculated at the General Register Office by means of Scheutz's Calculating Machine. The work was divided into three sections, each of which contained a separate Life Table of seven columns. The first section related to persons "consisting of such proportions at each age as are produced by the births." The second section related to males only, and the third to females only. The radix of the first section was a million births, of the second 510,745 births, and of the third 488,255 births. The last two sections were constructed independently of each other, while the first was formed by combining the other two. The results of these calculations, which comprise monetary Tables, showing the values of annuities on single and joint lives for all ages, are claimed by Dr. Farr to have been deduced not from the population or deaths alone, but from the ratio the one bears to the other at different ages. This Table has long been recognized as a standard one for the purpose of computations relating to the general population of this country, the Offices using it being principally those transacting Industrial business.

Table No. 4, which was constructed by Dr. Ogle from the Census Returns of 1871 and 1881 and the deaths recorded during the ten years 1871 to 1880, was published in the Supplement to the 45th

Annual Report of the Registrar-General, issued in 1885. The mean population of these two years was 24,343,348, of which 11,849,414 were males and 12,493,934 were females. The number of deaths recorded during the decennial period was 5,178,311, of which 2,679,416 were males, and 2,498,895 were females. The results of this Table are remarkable, as showing in a marked degree a noticeable decline in the English death-rate at the younger ages in both sexes, though at the older ages the rate of mortality appears to be slightly more unfavourable in this Table than in No. 3. The effect of this decline in the death-rate may be readily seen by comparing the Expectations of Life at birth in the two Tables. In Dr. Farr's Table the Expectation of males was 39·91 years and of females 41·85 years, whereas, in Dr. Ogle's Table, the Expectations are 41·35 and 44·62 years respectively, the increase in longevity, which is most conspicuous at the younger ages, being nearly two years in males and nearly three years in females. The causes to which this increased longevity may be traced are mainly two—the operation of the Public Health Acts and the steady decrease of deaths from tubercular disease—a disease which is most prevalent in the earlier years of life. No doubt, too, the advance of medical science and of education during the last half century has had no small influence on the death-rate, although, on the other hand, the vastly increased rush and competition which has taken place within recent years must go far to neutralize this influence.

Table No. 5 is of a similar character to No. 4, being constructed by Dr. Ogle's successor, Dr. Tatham, from the Censuses of 1881 and 1891 and the deaths during the decennium. After necessary corrections the true mean population was found to be 27,385,056 and the number of deaths 5,244,771. These figures were divided by the two sexes as follows: males, 13,298,670 living and 2,698,316 deaths; females, 14,086,386 living and 2,546,455 deaths. They formed the basis of the Life Table, 1881-90, described in the Supplement to the Registrar-General's 55th Annual Report published in 1897. Here, again, we observe an improvement in the death-rate over the preceding investigation ten years before, the Expectations of Life at birth for males and females respectively being, by this Table, 43·66 and 47·18 years as against 41·35 and 44·62 years in Dr. Ogle's Table, the increase in longevity being over two years in males and two-and-a-half years in females. Dr. Tatham, in his letter to the Registrar-General, further illustrates this improvement by stating that while, by Dr. Farr's third Table, a million males born are reduced to half a million during the 45 years of their age, by Dr. Ogle's Table this amount of reduction is not reached till the 48th year, and by his own Table it is further postponed till the 52nd year. This last Table also shows an improved Expectation of Life up to age 26 as compared with the two earlier Tables; from ages 27 to 44 the Expectations are lower than those by Dr. Farr's, but higher than those by Dr. Ogle's Table; while for age 45 and upwards they are lower by the new Table than by either of the other two.

HEALTHY DISTRICTS TABLES.

These Tables, which are two in number, were constructed from the data which formed the basis of the English Life Tables Nos. 3 and 5. A similar Table was also compiled by Dr. Ogle, but for various reasons this Table has been found to be of little value for statistical purposes. The object of these Tables was to form a standard showing the rate of mortality under very favourable conditions.

The earlier of these Tables was based by Dr. Farr upon the Census Returns of 1851 and deaths during the five years 1849–53 in 63 districts of England and Wales, in which the rate of mortality had been found not to exceed 17 per thousand during the period 1841–50. The total population and number of deaths which formed the basis of this Table were 996,773 and 87,345 respectively. The Expectation of Life at birth by this Table was for males 48·56, and for females 49·45, being 8½ and 7½ years respectively in excess of those for the whole country in the two sexes. A full account of the construction of the Table was given by Dr. Farr in a Paper read before the Royal Society in 1860, and published in the *Philosophical Transactions* of that year.

The later Table was constructed by Dr. Tatham, who describes the methods he adopted for its formation in the Supplement to the 55th Report of the Registrar-General. The basis of this Table was the mean population deduced from the Census Returns of 1881 and 1891 and the deaths during the intervening period in 263 districts of England and Wales, in which the corrected death-rates during this period did not exceed 15 per thousand. These districts consisted of 43, which were included in both Tables, and 220 in the second Table only. The mean population was 4,603,055, of which 2,250,227 were males, and 2,352,828 females; and the number of deaths was 737,195, of which 376,733 were those of males, and 360,462 those of females. The Expectation of Life at birth by this Table was for males 51·48, and for females 54·04 years, being an increase over Dr. Farr's Table of about three years and four-and-a-half years respectively.

PEERAGE TABLES.

The Tables commonly known by this title were compiled some forty years ago by Mr. A. H. Bailey and Mr. Archibald Day, two distinguished members of the actuarial profession, who, though for some years they have retired from active work, are still happily with us. The results of their investigations into the mortality prevailing among the upper classes, were embodied in a Paper read before the Institute of Actuaries on 29th April, 1861.* The rate of mortality amongst these classes had been the subject of investigation on

* *J. I. A.* ix., p. 305.

previous occasions, though in a very imperfect manner. Dr. Guy, for instance, who had made a similar enquiry, based his observations upon the deaths alone, and hence his results, owing to the numbers living at each age not being stationary in character, are erroneous, the Expectations of Life brought out by his Table being much less than they would have been had they been deduced from the numbers living as well as the deaths.

The observations recorded by Messrs. Bailey and Day, which were extracted from the different Peerages, commenced with the anniversaries of the dates of birth in the year 1800 of those who were born in the last century, and with the actual dates of birth of the remainder, and they terminated on 31st December, 1855, the only assumption made being that, when, as occasionally happened, the year only of birth or death was stated, the day was taken as 30th June. The total number of deaths in the observations was 3,191, of which 1,938 were of males and 1,253 of females; while of the 4,282 lives existing at the close of the observations, 2,283 were of the male and 1,999 of the female sex.

It was found that, on the whole, the rate of mortality amongst the Peerage classes was much lighter than that amongst the general population, as represented by the English Life Tables, this advantage being most apparent during the periods of infancy and childhood, since, under the age of ten, the rate of mortality amongst the former class was a little under one-third of that amongst the latter. From ages ten to twenty the two Tables nearly coincide, but from ages twenty to thirty-nine. the rate of mortality amongst the Peerage families is in excess of that in the English Life Table. At subsequent ages the Peerage Tables exhibit greater longevity.

The Expectation of Life of the male members of the Peerage is at all ages under 73, greater not only than that among the general population, but even than that among the Select Lives of the *Equitable* Experience, with the exception in the latter case of the period between ages 15 and 21. It is greater than that among Government Annuitants at all ages under 62, and throughout approaches pretty nearly to that in Dr. Farr's Healthy Districts Table. At the older ages it coincides fairly with the Expectation both in the English Life Table and the *Equitable* Experience.

For reasons which are given in their Paper, the authors applied no method of graduation to their results. Four years later, however, Mr. G. W. Berridge, in a Paper also read before the Institute, described a method of graduation which he had successfully applied to these Tables.* This method, which was similar to that employed by Dr. Farr in his English Life Table, No. 3, consisted of the redistribution of the logarithms of the probabilities of living a year by means of a series of differences. Mr. Berridge, at the close of his Paper, instituted a comparison between the annuities derived from his graduated Table and those given by others, with the result that

* *J. I. A.* xii., p. 220.

"the Peerage annuities are higher than the others at all the earlier and middle ages, with the exception of ages 10 and 15 in Davies' Equitable, and 15 and 20 in the Carlisle Experience and Equitable Table (Morgan's); falling below them at the older ages in the following order:—Davies' Equitable at age 60, Carlisle at 65, Morgan's Equitable at 70, English Life (No. 1) at 75, English Life (No. 3) and Experience at 80. The greatest difference in the middle of life is that between the Peerage and English Life (No. 3); it amounts to rather more than one year's purchase. These remarks apply, of course, inversely to the premiums—the maximum difference in the annual premiums being at age 50, and amounting to 9*s.* 8*d.* per cent."

These Tables are not infrequently used by Life Offices in classes of assurance where a light rate of mortality is believed to prevail. They are, for example, adopted as a standard Mortality Table for valuing Children's Endowment Policies, as well as for calculating premiums for assurances on the lives of members of the Royal Family.

It may be added that Tables from Peerage statistics have been constructed by Dr. Sprague for the purpose of finding probabilities of marriage and issue. The results of his researches have been published in Papers read by him before the Royal Society of Edinburgh and the Institute of Actuaries.*

GOVERNMENT ANNUITANTS' EXPERIENCE.

This Table now in use is the third of the kind constructed for the exclusive purpose of calculating the amount of purchase-money that should be invested in order to obtain a Government Annuity. As has been already remarked, at the commencement of this class of business by the Government nearly a century ago, the rates were based on the erroneous Northampton Table. As soon, however, as the adverse Reports had been made to the Treasury by Mr. John Finlaison—who, at a subsequent period, was appointed Actuary to the National Debt—and by the Committee of the House of Commons, the former was directed to spare no labour in the investigation of the true Law of Mortality prevailing among this class. His first attempt lay in the direction of obtaining data for the purpose from the records of the births and deaths of the nobility, but, owing to the laborious nature of the enquiry, he was obliged to abandon it. He then turned to the Exchequer Offices of England and Ireland, where he found the necessary materials in the records of the various Tontines from 1765 to 1789, which, together with the existing annuitants and observations of his own on the Chelsea and Greenwich pensioners, afforded him the means of comparing 66,036 lives, of which 27,447 were males and 38,589 females. An additional advantage possessed by these records lay in the fact that in every instance the age was stated on

* *J. I. A.* xxi., p. 406; xxii., p. 352; xxv., p. 160; xxviii., p. 350; *Proceedings of the Royal Society of Edinburgh*, Vols. x. and xiv.

oath. The result of his calculations was the discovery that the average duration of human life had sensibly increased during the century. The Tables, which were the first that exhibited the difference between male and female mortality, have been proved to be extremely accurate, having regard to the character of the data at his disposal.

In 1860, his son and successor, Mr. A. G. Finlaison, made a similar investigation, the data employed being the actual Experience of Government Annuitants from the commencement of the grant of such annuities. The number of lives observed was 27,692, of which 11,154 were males and 16,538 females. It was then found that while in the male sex the mortality experienced agreed with that estimated by Mr. John Finlaison, in the female sex the rate of mortality was higher in the later than in the earlier Table. This circumstance was apparently due to the fact that the first Table was founded upon observations comprising a relatively large number of recently selected lives, since the existing Experience which formed a large part of the observations did not extend over more than 20 years. In the second Table, however, the proportion of such lives was much smaller. Notwithstanding this result, the Treasury decided that it would be safer to retain the old Table of rates, which therefore remained in force till their revision in 1884.

The third investigation into this subject took place in 1883, and was conducted by Mr. A. J. Finlaison, a grandson of Mr. John Finlaison, and then, as now, Actuary to the National Debt. The period under observation extended over 67 years, 1808-75, and the number of lives included in the enquiry was 30,788, of which 10,929 were males and 19,859 females, the proportion of deaths being 74 per cent. of the total observations. Owing to the long period covered by the Experience, it was found practicable to investigate the "Effect of Selection," which was exhibited according to years expired from date of purchase, 0, 1, 2, 3 and 4 and upwards. The Tables thus analyzed clearly point to a much lighter rate of mortality during the first few years than subsequently. They were graduated by two methods, the first, that of Gompertz, being applied to the Select Lives, and the second, that of Woolhouse, to those assumed to be merely average.

These last Tables are now in general use for valuing annuities of every description, being far more complete and accurate than any other existing Tables of the kind.

CHAPTER XII.

THE CALCULATION OF RATES OF PREMIUM.

The labours of the Actuary, as applied to the construction of correct Mortality Tables, and to estimating the rate of interest likely to be realized on invested capital over a long series of years, all concentrate themselves in the solution of one problem, viz., the Rates of Premium which should be charged in order to provide adequately for the benefits of Life Assurance in its innumerable forms. This problem, as Dr. Farr has aptly remarked, "stands at the threshold of Life Assurance." It is clear then that, if we desire to understand thoroughly the fundamental principles of the subject which in the preceding chapters we have been discussing, it is necessary to have a complete knowledge of that portion of it which is comprised under the heading of this chapter.

Of the various kinds of premiums in general use, all or nearly all may be traced to one of three main divisions, viz., Single Premiums, Annual Uniform or Level Premiums, and Natural Premiums. These, again, are divided into two classes, Net or Pure Premiums and Gross or Office Premiums, the latter being obtained from the former by the addition of a sum sufficient in amount to provide for expenses and other contingencies, the nature of which we shall presently discuss. It is to Net Premiums exclusively that the following remarks apply.

Single Premiums consist of payments made in a lump sum to secure the benefit of Life Assurance either at death, or at the end of a stipulated period, or during a term of years, or on the failure of some contingency, their amount varying according to the age at entry and the particular description of benefit which they are designed to secure. The Mortality Table and Rate of Interest upon which they are to be based having been first determined, it is only necessary to ascertain the different amounts which will, according to the basis selected, provide for the contingency of the Sum Assured becoming payable in the first and each of the following years of assurance up to the end of the term. The total of these different amounts represents the Single Premium.

From the Single Premium thus calculated it is an easy matter to find the corresponding Annual Level Premium, which is simply the amount of an annuity, payable in advance either during life or for a specified period, which the Single Premium will purchase.

Natural Premiums differ from Level Premiums in the fact that, since they are dependent upon the Rate of Mortality from year to year, they gradually increase in amount with the age of the Life Assured. At the younger ages they are much lower and at the older ages much higher than Level Premiums charged at the usual assuring ages. For example, at age 30 at entry the Level Premium for Whole Term Assurance of £100 by the H^{M} 3 per cent. Table is £1. 17*s.* 7*d.* throughout life, which by the same Table the Natural Premium commences at 15*s.* and rises to £1 after ten years, to £1. 11*s.* after twenty years, to £2. 17*s.* 8*d.* after thirty years, to £6. 0*s.* 9*d.* after forty years, and to £14. 0*s.* 11*d.* after fifty years. The Natural Premium may also take the form of a Level Premium combined with a diminishing Sum Assured, the principle upon which it is based, namely, that each year's premium only provides for that year's risk, remaining unchanged. Another distinction between Level Premiums and Natural Premiums is that whereas in the case of the former system evidence of good health is required only at the outset, in the case of the latter system it is required before the payment of *each* Renewal Premium. To place the two systems on equal terms in this respect it would be necessary to make an addition to the Natural Premium at every succeeding age to cover the option exercised by the Assured at every renewal. Such an addition at the older ages is necessarily a heavy proportion of the Term Premium.

So much then as regards Net Premiums, or the theoretical part of our subject. These premiums are only sufficient to provide for the bare Sum Assured without any allowance for expenses and profit. In practice, however, since Life Assurance Companies are not philanthropic institutions but associations trading for profit, these items cannot be ignored. To form the Gross or Office Premiums, which are tabulated in Life Office Prospectuses, an addition is made to the Net Premiums to cover expenses, profit, and contingencies. The nature of this addition, or "loading," as it is called, varies in each of the three divisions of premiums which we have been discussing. For Single Premiums it may consist of a small percentage of the Net Premium. For Natural Premiums it is generally in the form of a single payment or "Entrance Fee," together with an annual payment uniform in amount irrespective of the age at entry, to meet the expenses of management, and of a percentage, say one-third of the Net Premium, for profit and contingencies. The "loading" for Level Premiums is of a more complicated nature, since, while it must be evenly spread over the whole of the period during which the premium is payable, the expenses which it is partly intended to cover are mainly incurred during the first year. In fact, the proportion they may be said to bear to the Gross Premium is about 80 per cent. in the first year and 8 per cent. in subsequent years. Hence, it is usual to assume a loading of a compound nature, the first part consisting of a percentage of the Sum Assured, spread in the form of an annuity equally over every premium, and the second part consisting of a percentage of the Gross Premium.

In the calculation of both Single and Annual Premiums, provision is made, in the great majority of Life Offices, for two distinct classes of Assurances, viz., Assurances which participate in the profits periodically distributed by the Office, and those which do not. For each of these classes a different scale of premiums is necessary, the difference being entirely one of "loading." In the case of Non-Profit Premiums, the amount of "loading" to be added is comparatively simple, since the principal item is that of expenses. In a Paper read before the Institute of Actuaries in 1892* the late Mr. H. J. Rothery suggested that the "loading" for Annual Premiums of this class should consist of (1) in respect of the first premium, £2 per cent. upon the Sum Assured and 5 per cent. upon the Gross Premium, and (2) in respect of each premium, including the first, 8 per cent. upon the Gross Premium. This method he found applicable equally to Whole Term and Endowment Assurances, the Single Premiums being obtained by commuting the Annual Premiums at 4 per cent. interest.

With regard to the calculation of "With Profit" Premiums, the amount of "loading" to be added should depend upon the particular method adopted by the Office in its Distribution of Surplus. The method of Distribution in which the "Bonus Loading" is the smallest is that of deferring the allotment of a share in the Surplus until the premiums accumulated at compound interest are equal to the Sum Assured. The method in which the "Bonus Loading" is the greatest is probably that known as the Compound Reversionary Bonus System. Other methods of Distribution require "Bonus Loadings" varying in amount between these two. While, however, these "Bonus Loadings" should theoretically correspond to the method of Distribution in vogue in a particular office, in practice this is by no means always the case, and for two reasons. First, Premiums are more or less regulated by competition, since these payments are actual facts, while Bonuses are mere estimates based upon previous experiences which may or may not be repeated. Hence, as a rule, the assuring public are more apt to be persuaded to select an Office with low premiums than one with high premiums. Secondly, an Office may, and not infrequently does, change its method of Distribution, but it cannot so easily alter its rates of premium to make them consistent with an improved method of Distribution.

The "Bonus Loadings," recommended by Mr. Rothery in his Paper already referred to for the two methods above-mentioned, were obtained in the following manner. For the Deferred Bonus Method he retained the "non-profit loading," but raised the premiums by the simple process of lowering the rate of interest on which they were based to $3\frac{1}{2}$ per cent. For the Compound Bonus System he lowered the rate of interest in a similar manner, and at the same time added another 10 per cent. to the Gross Premiums.

* *J. I. A.* xxx., p. 131.

The subject of the Calculation of Premiums would not be complete without some reference to the distinctions arising between the practical application of the "Natural Premium" and "Level Premium" Systems, and hence we shall conclude this chapter with a few remarks upon the nature of such distinctions.

In the course of our previous observations upon the principles underlying the construction of these two classes of premiums we have explained the theory of each system. In practice, however, the Companies which transact business under the "Natural Premium System," and which are generally known as Assessment Companies, never for a moment admit the probability of any increase ever taking place in the amounts originally charged at the ages at entry, although they invariably reserve to themselves the right to charge policyholders at any time the increased rate at their then ages. For this practice they give very plausible though utterly fallacious reasons based on what they style the average rate of mortality by Standard Tables. "If Assessment Companies," says Mr. George King, "doing a business by Natural Premiums would stick to the principle that the rate of mortality depends upon a man's present age, we could not quarrel with them. It is perfectly legitimate to charge Natural Premiums, and the business is perfectly sound scientifically, and there is no reason why it should not be sound commercially. The prospectus of an American Company dealing with this says that Natural Premiums are fair 'if they are equitably apportioned among the members according to the age of the member and the amount of assurance held by each.' If that were adhered to, then Assessment business would be successful, but it is open to the objection that as time goes on the premiums will be raised. In another Assessment prospectus it is claimed that the history of the Company during its first ten years 'is an evidence that the Association will be able to meet all its claims without increasing its rates beyond the amount indicated at age at entry.' But that is utterly fallacious. It is impossible for a Society to succeed which holds out such hopes to its members, because Assessments must increase, and members would get disgusted and leave, and the end is disaster."*

The essential difference between 'Natural Premiums' and 'Level Premiums' has also been discussed in an elaborate Paper on the subject by Mr. H. W. Manly, the late President of the Institute of Actuaries. "In making this comparison," he says, "let us be careful to compare things of the same kind. In the first place, the contract on the part of the Mutual Assessment Company is to pay a definite sum and no more, and in that respect it corresponds to a Non-Profit Policy of the Level Premium Companies. In the second place the premium charged by the Level Premium Companies combines the cost of the risk for the whole of life, and the contribution towards expenses. In comparing, therefore, the Assessment rates (exclusive of the dues for expenses) with the Level

* *Post Magazine*, Vol. liii., p. 355.

Premiums, we must throw off the loading (which is the contribution towards expenses), and make the comparison with the net or prime cost portion of the premiums. Next, as this scheme is brought forward as a rival to the 'old-line' Companies, and as a new and improved method of providing a sum for the benefit of a member's family at his death, and not as a temporary expedient to cover the possibility of death during a short period, we must compare the cost up to the extreme limit of life, and not stop at the age when the 'Natural Premiums' or Mortuary Assessments begin to grow heavy. . . . In the Mutual Assessment scheme the indemnity element is exaggerated to the total sacrifice of the investment element, and, therefore, may suit another class who only want a Temporary Assurance; but the ordinary form of assurance combines in such perfect proportions the two elements of indemnity and investment that it practically suits all classes."*

Another equally high authority, Mr. Augustus Hendriks, in the course of a Presidential Address to the members of the Institute of Actuaries, remarks:—"Assessmentism at its best may be likened to a magic lantern. The oil to lighten it up is the annual assessment. The lantern throws a shadow on a white sheet, which takes the shape of a policy. The supply of oil lasts for one year certain, and the shadow remains on the sheet, and is equal to a palpable form for that space of time—and from year to year—but the oil becomes dearer and dearer, and, when too dear, *le jeu ne vaut plus la chandelle*, and the supply stops. There is no tank containing an appreciable reserve of oil—the lantern is extinguished—the blank sheet is there, but where is the shadow? The shadow was a dissolving view: the policy on the slide. And yet a certain section of the unthinking public are lured from the firm ground of Life Assurance to the quicksand of Assessmentism."†

* *J. I. A.* xxvi., p. 201.
† *J. I. A.* xxx., p. 284.

CHAPTER XIII.

RESERVES AND SURRENDER VALUES.

In the preceding chapter we have seen that the essential difference between the "Natural Premium" and the "Level Premium" systems, is that, while the former merely meets the risk for each year as it arises, such risk increasing with the current age and consequently the amount required to meet it, the latter, being uniform throughout the period during which it is payable, contains within itself a sufficient amount to cover the risk during the whole term of the assurance. In the early years of assurance the premiums under this system are more than sufficient for the current risk, and in the later years they are too low for this purpose. It is the accumulation of the excess payments of the early years at compound interest that balances the insufficiency of the later premiums to meet the current claims. This accumulation, which is called the Reserve, is of such a nature that, at any time during the continuance of the assurance, its then value, together with that of the future premiums calculated on the same basis, ought to be equal to the value of the sum assured. From this it is obvious that the Reserve against any policy is simply the difference between the values of the sum assured and the future premiums. Should the premiums have been already paid up, either in the form of a single payment or during a limited number of years, then the amount of the Reserve should be equal to the value of the sum assured.

While it is an important part of the duty of an Actuary to see that the premiums which he sets out in the various Tables contained in a Life Office prospectus are amply sufficient to cover the risk of death together with the items of expenses and profit, it is no less important that he should carefully watch the progress of the liabilities which his office had incurred, and ascertain from time to time that the Reserves formed by the accumulated premiums are of an amount fully adequate to meet such liabilities. This he does by means of a detailed valuation, in which suitable Mortality Tables and Rates of Interest are selected as a basis. There are two methods of making such a Valuation—the Gross Premium Method and the Net Premium Method. When the former method is used, a considerable deduction is made from the Gross Premiums for future expenses and profits, whereas by the latter method the whole of the loading is reserved for this purpose. It is therefore clear that under ordinary conditions a Net Premium Valuation gives higher Reserves than a Gross Premium

one—a fact which should not be lost sight of in comparing the financial position of different Life Offices.

It is of the highest consequence to the future welfare of a Life Assurance Company that the Method of Valuation adopted at periodic intervals for ascertaining its liabilities should be as stringent as circumstances permit. There are, it need scarcely be said, Valuations *and* Valuations, and hence a short explanation of the different elements affecting the results of Valuations by various standards may be of some assistance to those who desire to be able to satisfy themselves in a simple manner as to the soundness or otherwise of a particular Office in which they are interested.

We have already referred to the fact that, under ordinary conditions, a Net Premium Valuation is more stringent than one by the Gross Premium Method. Two other elements, however, affect the stringency of a Valuation, viz., the Mortality Table and the Rate of Interest employed in estimating the liabilities of an Office. In the early days of Life Assurance, when Mortality Tables were few in number and only partially representative of the actual mortality prevailing amongst assured lives, the Table adopted was frequently a matter of convenience rather than of scientific accuracy. During the first quarter of the present century the Northampton Table was supreme, but this Table gradually gave place to the Carlisle Table, and the Carlisle Table to the H^M and $H^{M(5)}$ Tables, each successive Table being of a more stringent character than its immediate predecessor.

As regards the Rate of Interest upon which Valuations have been based, we find that a change of a similar character has taken place during the present century. This change, however, is due as much to the circumstance that the general Rate of Interest on securities of all kinds has fallen considerably during this period, as to the desire on the part of Life Offices to strengthen their Reserves. Still, the fact remains that, whereas less than 50 years ago many offices continued to value their liabilities at 4 per cent. interest, for some years past $3\frac{1}{2}$ per cent. has almost become obsolete, 3 per cent. is beginning to be thought a high rate, while $2\frac{3}{4}$ and $2\frac{1}{2}$ per cent. rates have been adopted by quite a number of Life Offices.

There are three ways in which a Life Office can strengthen its Reserves. It can, as indicated above, employ a Mortality Table of a higher standard—such as the H^M or $H^{M(5)}$ combined with a low Rate of Interest—than it has hitherto adopted. It can also make a Valuation less stringent than this, and at the same time set aside a proportion of the surplus formed by the excess of the Assurance Fund over the value of the liabilities for future contingencies. A third and equally effective method is to value the assets at considerably below their market value, and thus to set up a concealed Reserve Fund, which on future occasions can be used to effect a reduction in the Rate of Interest, without at the same time diminishing the available surplus. Each of these methods is in use among Life Offices at the present time, and each has its advantages according to the circumstances of the Office adopting it.

Let us now consider the effect of the Life Assurance Companies Act upon this part of our subject. If we turn to the Fifth and Sixth Schedules of this Act, we find that they contain a large number of searching questions, the answers to which necessarily supply a large amount of information as to the Method of Valuation adopted in a particular Company. It must be borne in mind that before this Act came into operation, no Company was obliged to publish any statement at all as to its financial position. Hence, only those did so that were able to place before the public returns of a favourable character. Now, however, all Companies registered under the Act are compelled to set out in detail the results of the Valuation of their liabilities at the end of every quinquennial or any other period of time which may happen to be customary.

The information to be obtained from these Schedules includes the principles upon which the Valuation is made, as well as the Mortality Tables and Rates of Interest employed in the Valuation. There is also a Summary of the different classes of Policies valued, these classes being divided into Assurances With and Without Profits and Annuities.

The object of these two Schedules, which was to enable an independent expert to form a rough judgment of the position of any Life Assurance Company, has been fully attained. The completeness of the information thus given to the public has been of incalculable value, not only for this purpose, but for that of securing a series of reliable statistics relating to the progress of British Life Offices during a period of nearly thirty years. So much has this portion of the Act been appreciated in our Australasian and South African Colonies, that it has with some unimportant modifications been incorporated into the various Acts passed in those Colonies for the regulation of Life Assurance Companies.

Closely connected with the subject of Reserves is that of Surrender Values. These represent the amounts which a Life Office is prepared to allow to the Assured upon the discontinuance of their Policies, provided a certain number—varying in different offices—of full Annual Premiums have been paid. Their relation to the Reserve Values of Policies lies in the fact that the principle upon which they are calculated is of a precisely similar nature, viz., the difference between the values of the sum which the Office has rendered itself liable to pay either at death or at the end of a fixed period, and the premiums charged by the Office to cover such liability. Although, however, this constitutes the principle on which such Values are based, an Office could never afford to devote the whole of the difference thus arrived at to the Surrender Value. To do so would not only be unfair to the interests of those policyholders who adhered to their contracts, but it would also be a source of actual loss to the Office. In the first place the Office, and through it the existing Assured, is entitled to a certain amount of profit from a surrendered Policy. Secondly, the imposition of a fine upon those of the Assured who are either unable or unwilling to keep up their

Policies, is only consistent with fair treatment to those who remain assured. Thirdly, it may be assumed with some degree of certainty that policyholders who discontinue their assurances are above the average as regards their prospects of longevity. And lastly, in order that an Office may keep up the number and quality of its assured lives, it must replace Policies discontinued with fresh ones, and this necessarily involves increased expenditure.

Most Offices publish in their prospectuses either Tables of minimum Surrender Values, or else an indication of the proportion which they bear to the amount of premiums paid. These minimum Surrender Values of course are only applicable in the early years of assurance, and have generally no particular connection with the Reserve Values. For instance, it is usual after three Annual Premiums have been paid to allow a Surrender Value of one-third of the total premiums received, in the case of ordinary Whole Life Assurances, and of one-half of such premiums in the case of Endowment Assurances. The proportion of the premiums received by the Office allowed as Surrender Value, in fact, depends almost entirely upon the proportion of the investment element in the assurance. Thus, in Limited Payment Policies, Endowment Assurances, Children's Endowments, and Leasehold Policies, the Surrender Value is invariably much higher in proportion to the premiums paid than in ordinary Whole Life Policies, while in assurances for short periods and against certain contingencies where there is no investment element, no Surrender Value as a rule is payable on discontinuance.

In the course of a recent investigation into the practice of Offices with regard to the payment of Surrender Values, "out of 72 companies, it was found that 41 grant Surrender Values when three years' premiums have been paid. The minimum amounts then allowed, where stated, are variously described as some percentage, varying from 30 per cent. to 50 per cent. of the premiums paid, or the premiums paid excluding the first. The matter is further complicated by the bonus being allowed in addition in some cases and not in others. Fourteen of the Companies allow Surrender Values after two years' premiums have been paid, and seven after the payment of one premium, while three do not make any allowance until five years' premiums have been paid. Of the remaining seven Companies, two make no reference in their prospectuses to Surrender Values, and the others state that Surrender Values are allowed, but do not state when a Surrender Value is first acquired. Of the 41 Companies who grant Surrender Values after the payment of three years' premiums, seven make an exception in the case of Endowment Assurances, and allow Surrender Values on these Policies when two years' premiums have been paid." *

It has been already stated that the practice of Offices with regard to minimum Surrender Values has no particular connection with the Reserve Values. It may be added that in theory it has been shown

* *J. I. A.* xxxv., p. 226.

that there is no real connection between Surrender Values and the amount of premiums actually paid. It will be recognized, therefore, that in this matter theory and practice are often widely separated, a state of things that cannot be regarded as altogether satisfactory.

Among the Improvements in Practice which will be found in the chapter under that heading, is that of nonforfeiture of lapsed Policies, by which system the Surrender Value of a Policy is automatically applied towards keeping it in force. This can be effected in three ways. The Surrender Value may either be sunk in the purchase of an annuity of the amount of the premium for a fixed period, after which the Policy altogether expires; or it may be used to pay the premiums as they become due, together with the necessary fines; or it may be applied in the purchase of a Paid-up Policy of a precisely similar nature to the original one, but of reduced amount.

From what has been said on this subject it may be inferred, and quite rightly, that so far from Life Offices desiring to make a profit out of discontinued Policies, the opposite is invariably the case. It may, indeed, be asserted that Offices do all in their power to encourage their Assured to keep up their Policies, and their efforts in this direction have not, it is feared, received from policyholders the amount of appreciation that they really deserve.

CHAPTER XIV.

DISTRIBUTION OF SURPLUS.

In order to be in a position to judge of the principles upon which an equitable Division of Surplus should be made, it is apparent that the reader should be thoroughly familiar with the sources from which such surplus is derived; and we therefore purpose to trace and analyze these sources as far as their complicated nature will permit.

In the course of his remarks upon the English Life Table No. 2, published in the Twelfth Report of the Registrar-General, Dr. Farr observes:—"The sources of profit in an Insurance Office are—(1) *The careful selection of lives.* The payment on deaths in the first year or years may be considerably reduced by a skilful selection. The saving is legitimate profit. A strict exclusion, however, of all but the best lives necessarily diminishes the amount of business. (2) *The investment of its funds securely at a high rate of interest* is another source of profit. Thus, if a stock of £1,566,644, which at 3 per cent. interest will meet the requirements of the Life Table, can be invested, as it has hitherto been by many Offices at 4 per cent. interest, the profit from this source will be £15,666 in the year. (3) The gains on Insurances on the *non-participating* terms, or on the *lapse of Policies*, also swell the profits. The price which the Office pays leaves it a considerable profit. If the life hold on in a Mutual Office it participates in the surplus. (4) The profit on all investments is reducible to *interest;* but it may be worth considering the case separately if such investments in the funds as were made by the *Equitable* and other Offices when £106 stock was acquired for £50, £60, £70, or £80 money, and will sell for £90 or £100 money, according to the state of the market. . . . The profits from these sources alone cover all the expenses in some Offices, and leave a surplus."

These remarks, however, were written, it must be remembered, nearly fifty years ago, when the real sources of surplus were not capable of so strict an analysis as at the present time. It will be noticed that Dr. Farr omits a very important source of profit from his list, viz., the excess of "loading" above the amount actually paid away in expenses and commission.

A more recent, and at the same time an extremely careful, analysis of the various sources of profit in the business of a Life Assurance Company has been made by Mr. T. G. C. Browne, the Actuary of one of the wealthiest and best-managed Offices in

this country. In a letter to the *Insurance Record* of 19th July, 1895, he sets out an elaborate Table, giving figures which represent the experience of his Office on this subject. The following is an extract from this Table:—

ANALYSIS OF PROFITS, 1890–4.

GROUP I.		
Loading (*less* Expenses and Commission), Surrenders, and Lapses		£63,587
GROUP II.		
Interest earned above 3 per cent., including Interest earned on Reversions at an assumed rate		79,144
GROUP III.		
(1) Mortality	£48,620	
(2) Investments realized, including the Profit from Reversions, *less* the assumed rate of Interest included in Group II.	10,811	
(3) Bonuses on Re-assurances	12,784	
(4) Interest on Investment Reserve Fund, undivided Balance from preceding period, and on accrued Profit	22,188	
(5) Issue Policies	2,560	
(6) Annuities	3,436	
		100,399
Total amount divided		£243,130

From this analysis it will be seen that the item representing the source of profit which stands highest, is that from excess interest, and that the profit from mortality comes only third. This result is borne out by the experience of nearly all Offices in which there is a considerable margin between the rate of interest actually yielded upon the funds, and that assumed in the valuation. It is naturally, however, more apparent in the older Offices where, owing to the average duration of the Policies being higher, the reserves constituting the fund on which the interest is earned, are greater than the more recently established Offices, in which, on the other hand, through the influence of selection, the rate of mortality is lighter.

Some Offices make a point of ascertaining every year the amount of surplus realized from the different sources indicated above, although they do not make a distribution at intervals of less than three or even five years. This plan, though somewhat troublesome, is often of great service to an Actuary, who can thus trace from year to year the progress of the surplus from each source, and consequently forecast, with a considerable amount of accuracy, the amount divisible at the end of the period.

In accordance with the provisions of the Life Assurance Companies Act, returns are periodically made by Life Offices, showing the amount of their Life Assurance fund at the end of the Valuation Period, and the ascertained value of their liabilities under their Assurance and Annuity contracts. The difference between these two amounts constitutes the surplus which has arisen since

the date of the previous Valuation. Of this surplus, however, it does not necessarily follow that the whole is distributed among the participating policyholders. In Proprietary Offices the shareholders are entitled to a percentage of the divisible surplus, generally ten per cent., though in a few Offices this share amounts to twenty per cent. Apart from this, however, it is not unusual for Offices to set aside a portion of the ascertained surplus for the purpose either of equalizing future bonuses or of providing for a more stringent method of valuation on a subsequent occasion. The balance then becomes divisible among those of the Assured who have effected "With Profit" Policies. Here, however, we have again a divergency in practice among Life Offices, some Offices allotting a bonus to every "With Profit" Policy in force at the end of the Valuation Period, and, at the same time, postponing the period when such bonus vests until the expiration of five years, while others make the distribution applicable only to such Policies as have been in force a certain number of years. By the former method, should the Policy either lapse or become a claim before the bonus vests, it ceases to be entitled to the share allotted to it, which accordingly falls into the surplus divisible on the following occasion. By the latter method all the Policies to which a bonus has been allotted receive the full benefit immediately.

The intervals between succeeding Distributions of Surplus vary with different Offices, or, perhaps it would be more correct to say, groups of Offices. One Office, the old *Equitable*—whose history we have dealt with at some length in these pages—till comparatively recently distributed its surplus at intervals of ten years. These intervals have now been reduced to five years. Septennial intervals are much favoured by Scotch Offices, although there appears to be a tendency to convert them into quinquennial intervals, which, indeed, are by far the most generally adopted by Life Offices. A few Offices favour triennial periods, but only one makes an annual distribution.

On this point we may recall the opinions of the late Mr. Charles Babbage, who, in the early part of the present century, was considered a very high authority on all matters connected with Life Assurance. In the course of his "Comparative View of Life Assurance," he remarks :—"The system of a septennial division of profits, which is the one most generally adopted, is preferable to that of the *Equitable* Society, but is still inferior to that of the period of five years, whilst an annual division distributes the profits with more regularity and justice than any other. In such a system the nominal sums may not be so large, but the real advantage to the Assured is more universally distributed. It would, however, be desirable to render these annual divisions more uniform in amount, by determining them from the average of a certain number of the preceding years. The first of these annual divisions, therefore, should not commence until after as many years have elapsed as the average to be deduced from."

Since the introduction of the system of Interim Bonuses into the practice of Life Offices, the advantages derived from a frequent Distribution of Surplus are less important than was formerly the case, and hence it may be submitted that, on the whole, a quinquennial distribution is the best, as it is the most general, method.

Few subjects have received greater attention from Actuaries within recent years than that of the proper method of distributing the ascertained surplus among the Assured of a Life Office, a number of Papers relating to the advantages of various methods having been read at different times before the Institutes of Actuaries and other similar bodies. Of these Papers may be mentioned those of the late Mr. Charles Jellicoe, Mr. W. P. Pattison (Messenger Prize Essay), and Mr. H. J. Rothery, and of Mr. James Terry, Dr. T. B. Sprague, Mr. G. J. Lidstone, and Mr. H. W. Andras, all read before the Institute of Actuaries,* as well as one by Mr. Archibald Hewat, read before the Actuarial Society of Edinburgh in 1880, and one by Mr. P. L. Newman, read before the Insurance Institute of Yorkshire in 1891. All these Papers, together with the discussions that followed their reading, form a valuable collection of different views on the subject held by various authorities.

Before discussing the merits of the different methods of Distribution of Surplus now in vogue among Life Offices, it will be as well that the main principles which, it is generally agreed, ought to govern such methods, should be made clear to the general reader. These principles are two in number. First, the surplus periodically distributed amongst the Assured, being, as we have seen, composed of the excess of the premiums paid over those found to have been absolutely necessary to cover the risk of the assurance and the expenses of management, as well as, in the case of Proprietary Offices, a dividend to the shareholders, should be allotted to each policyholder as far as possible in proportion to the amount of his contribution to such surplus. Secondly, the method of distribution adopted should be of a simple character, and one easily comprehended by those for whose benefit it is made. The first of these principles may be said, in a sense, to be applicable to every method of distribution for the reason that, should the younger Assured receive too much or too little, the reverse takes place as their Policies become longer in duration, so that eventually all who survive their Expectation will, under any system, have received bonuses fairly proportionate to their contributions. On the other hand, however, a particular system may prove unjust to those Assured under Policies which either are discontinued or become claims prematurely. But even to these Assured the injustice is of a very limited character, since, as under a Tontine Assurance of which the Bonus System is only a modification, they have entered, or are supposed to have entered, upon the contract with their eyes open to the advantages and defects

* *J. I. A.* vi., pp. 290, 344; ix., p. 341; x., pp. 130, 328; xiv., p. 396; xxx., p. 131; xxxii., pp. 73, 320.

of the particular mode of Distribution of Surplus which has been adopted by the Office they have selected.

This leads us to the second principle which ought to govern a sound method of bonus allotments, viz., that of simplicity. It may be premised that, while in theory every one who enters into a contract is considered to understand its nature, in practice, so far at any rate as regards Life Assurance, the opposite is often the case. Hence the great importance of this principle to policyholders generally. Of late years the tendency of Life Offices, with respect to methods of Distribution of Surplus, has undoubtedly been in this direction, as may be seen when the old cumbrous methods are compared with those of the present day.

In his Paper referred to above, Mr. P. L. Newman classifies 76 British Offices according to their particular methods of Distribution of Surplus. He divides them into the following 11 classes:—

(i) Offices giving a uniform bonus or an equal percentage per annum for each premium paid during the valuation period. (22)

(ii) Offices giving a compound bonus or a uniform percentage upon previous bonus additions as well as upon the sum assured. (12)

(iii) Offices dividing in proportion to either the premiums or the loading paid during the valuation period. (8)

(iv) Offices giving a reduction, by way of percentage, of the premiums after a fixed period. (5)

(v) Offices dividing partly in proportion to the premiums and loading paid during the valuation period, and partly according to the excess in the rate of interest realized on the Reserve Values over that assumed at the previous valuation. (8)

(vi) Offices dividing in proportion to the difference between the accumulated premiums upon an assurance commencing at the date of the last previous valuation at the then age of the Assured, and the reserve for such an assurance at the time of division. (5)

(vii) Offices dividing only among those Policies, the premiums on which, accumulated at compound interest, amount to the sum assured. (2)

(viii) Offices giving a bonus in proportion to the number of premiums paid since the commencement of the Policy. (3)

(ix) Offices dividing in proportion to the premiums paid in the valuation period, previous bonuses being treated as new assurances. (2)

(x) Offices whose systems of distribution differ from those above stated and from each other. (9)

(xi) Offices having, in addition to their ordinary methods, Deferred Bonus Schemes. (15)

From this classification, which, it must be remembered, was made ten years ago, it will be noticed that there are more than twenty different methods in existence with regard to the Distribution of Surplus. The great majority of these schemes are, however, of minor importance, and are gradually being modified in such a way as to be classified among one of three distinct methods, viz., those represented by Classes i., ii., and v. For their characteristics and general results reference may be made to Mr. Newman's Paper. It will be sufficient for our purpose to limit our remarks to a discussion of the three methods just referred to, which in principle are really only two, viz., the "Uniform Reversionary" Bonus method and the "Contribution" method.

The "Uniform Reversionary Bonus" method has been described by Mr. H. W. Andras as follows:—"The Reversionary Bonus allotted is calculated as a percentage per annum on the Sum Assured only, or on the Sum Assured and existing Bonus Additions for the number of years the Policy has been in force, or for the number of years' premiums due and paid during the valuation period. The bonus allotted at the first distribution after the Policy is effected, in respect of the period between the date of commencement of the assurance and the first distribution, in some Offices vests at once, no matter how short a time the Policy may have been in force, but as a rule there is a period from the date of assurance which must elapse before any allotted bonus vests, a reserve being made at the valuation for the Deferred Bonuses allotted to Policies which have not yet qualified to participate."

The characteristics of this method of distribution are its extreme simplicity, Cash Bonuses increasing with the duration of a Policy, and, under certain conditions, a return of the surplus to the Assured in proportion to their contributions. These conditions are mainly that the premiums have been loaded with due regard to this method of distribution, and that the rate of interest assumed in the valuation is considerably below that actually realized upon the funds.

When this method is applied to existing Reversionary Bonus Additions as well as to the Sum Assured, it has the effect, in the case of those Policies in which these additions have not been surrendered, of providing Reversionary Bonuses increasing in amount with the duration of the Policies. Hence, from the application of the Compound Bonus System old Policies with heavy bonuses attached derive a very considerable benefit, while recent Policies come off rather badly.

Among the points in favour of this system, whether in its simple or compound form, is the fact that in the case of Endowment Assurances, especially those of short duration, it produces very fair results, and since in most Offices these Assurances form the bulk of the new business, this circumstance is of no small advantage. Another point in its favour is the increasing number of Offices which are adopting it either wholly or partially.

The "Contribution Method," which is briefly described by Mr. Newman under Class v., was originally applied to the Distribution of Surplus by a Life Office by the late Mr. Sheppard Homans, of New York, whose name is accordingly inseparably connected with it. In a Paper contributed to the *Journal of the Institute of Actuaries*, in 1863,* he gives an account of its principles and practical working. The former consist of crediting the Assured with the Reserve Value at the previous distribution together with the premiums since received, all accumulated at Compound Interest, and of charging them with the actual cost of the Assurance since the last distribution, together with the Reserve Value at the present time, the rates of interest and mortality assumed being those actually experienced.

Mr. Sheppard Homans' method, though popular in the United States, has never in its entirety found advocates in this country, on account of the complicated and somewhat cumbrous processes of calculation which it entails. Modifications of it have, however, been successfully applied to the Distribution of Surplus in British and Australian Life Offices. One of these modifications was introduced into the Office with which he was then connected by Dr. Sprague, who in a note on the subject given in the *Journal of the Institute of Actuaries*, in 1868,† thus describes his plan, which, he claims, combines in the highest degree the requisites of justice and facility of application, and which has been found in practice to give very satisfactory results:—"If the average rate of interest at which the total funds, inclusive of bankers' and agents' balances, and other unproductive assets, are improved, exceeds the rate at which the valuations are made, it is clear that a profit will be realized in the nature of excess of interest on the amount of the funds at the last valuation, to which profit the new members have contributed nothing. Let the amount of profit so earned by each of the old Assured still remaining on the books be ascertained and appropriated to his Policy. . . . The sum of all these amounts being found and subtracted from the surplus divisible among the Assured, there will remain a sum which may be fairly divided among all the Assured in proportion to the premiums (without interest) they have respectively paid since the last valuation. As regards persons of the same age at entry, it is clear that, apart from the effect of selection, the profit on their current premiums must be nearly the same whenever their policies were effected; and if the premiums are loaded with a percentage on the net premium, or approximately so, the Distribution of the Surplus in proportion to the premiums paid will give very fair results. This method will have the effect of giving larger cash bonuses to the Policies the longer they have been in force, but not unreasonably or unfairly so."

With regard to Dr. Sprague's plan just described, it may be remarked that, of the eight British Life Offices adopting it, four

* *J. I. A.* xi., p. 121.
† *J. I. A.* xiv., p. 326.

divide the balance of the surplus in proportion to the premiums, and four in proportion to the loading received during the valuation period. In the Australian Offices, most, if not all, of which seem to have adopted this system, the "loading" method of distribution is universal.

While admitting that the "Contribution Method" as modified by Dr. Sprague is perfectly sound in principle, it cannot be said to possess the simplicity and elasticity which are such prominent features in the "Uniform Bonus Method." It may well happen that, owing to a wide margin between the rate of interest earned and that assumed, there will appear a large surplus to be divided amongst the Policies of comparatively long duration; while, on the other hand, the incidence of a heavy rate of mortality will have the effect of considerably diminishing the surplus allotted to Policies of short duration. Not that there is anything unfair in this method, since it is only just that fluctuations in surplus should be borne principally by the younger policyholders. At the same time it must be remembered that in order to attract new business the principle of dealing even-handed justice between the old and young Assured is not necessarily a wise policy, and hence the adoption of this method should be made only when circumstances on the whole render it desirable.

Allusion has been made to the fact that Dr. Sprague's plan is universal among Australian Offices. In a Paper read before the Actuarial Society of America by Mr. D. Carment in 1893, he describes its practical working in these Offices. After referring to the fact that this method has entirely removed the inequalities and injustice which were produced by that formerly in use, viz., that of allotting bonuses in proportion to the Policy Values, he goes on to say:—"Its principal disadvantages are that it is undoubtedly somewhat troublesome and laborious to apply, and it is difficult to explain to the general public, who can generally much more readily appreciate the supposed equity of a bonus which bears some percentage relation either to the amount assured or to the premiums paid. On the other hand, it seems to me to completely solve the difficulty which, judging from some recent discussions at the Institute of Actuaries, seems to beset some of the English Companies as to the proper rates of Bonus to be allotted to Endowment Assurance Policies; it being argued by some that such Policies may fairly be allowed Reversionary Bonuses equal to those allotted to Whole Life Policies, while others point out that this depends very much on the rates of premium charged to holders of such contracts. . . . I believe it will be generally found that the method of apportionment I have been endeavouring to describe, wherein the profit from mortality and from miscellaneous sources is thrown in with the profit from loading, will give results at least as free from objection as any other which can be devised, bearing in mind that absolute equity in the case of every individual Policy is for many reasons unattainable."

Other forms of the "Contribution Method" are those described by the late Mr. H. J. Rothery in a Paper read before the Institute of Actuaries in 1892,* and by Mr. T. G. C. Browne, both in the course of a discussion on a Paper by Mr. G. J. Lidstone, read before the Institute in 1895,† and also more fully in his letter to the *Insurance Record*, referred to at the beginning of this chapter.

Mr. Browne's system differs from that of Dr. Sprague in the division of the sources of surplus into three groups instead of only two, the profits from the third group being distributed rateably between the two classes of policyholders formed by those whose Policies had shared in the previous distribution and those who had been assured since. In this system the mortality profit, or loss, as the case may be, is relegated to the third group, so that the fluctuations so inseparable from this source are less apparent than under Dr. Sprague's system. We may add that Mr. Browne has applied his method to his own Office with very great success, though we believe that it is the only Office which at present has adopted it either in this country or elsewhere. There seems no reason, however. why it should not become more popular, especially among those Offices which are changing their systems, since the elastic nature of its application renders it very easily adaptable to varying conditions and circumstances.

* *J. I. A.* xxx., p. 131.
† *J. I. A.* xxxii., p. 115.

CHAPTER XV.

RATED-UP LIVES.

So much misunderstanding has arisen as to the principles upon which Life Offices act with regard to accepting risks on the lives of persons, which for various reasons cannot be considered as first-class, that a short chapter may well be devoted to a consideration of a subject of so much practical importance.

Such lives belong as a rule to one of three classes, viz. :— (1) those who show symptoms of some organic disease, (2) those whose family history is of an unsatisfactory character, and (3) those whose occupation is attended with more than ordinary risk.

With regard to the first of these classes, the addition made to the premium varies with each individual risk, and no definite rule can be laid down either by the Directors or by the Medical Examiner as to the number of years that ought to be added to the proposer's age. Among the causes of surcharge in this class of lives are albuminuria, a gouty tendency, suspected intemperate habits, a badly-developed chest, some personal defect, and slight affections of the heart or other prominent organs of the body. Should any of these causes be of a serious character, the life is generally declined, although there are Offices which are willing to accept even such lives, but at what may be perhaps regarded as prohibitory rates.

The second and third classes are more readily adapted to the application of fixed rules. In the cases where unsatisfactory family history is the cause of a surcharge being made, the principal reasons which induce Offices to regard lives in this class as below the average, are the deaths of one or more members of the proposer's immediate relations from either Consumption, Cancer, or Intemperance. Of these three causes of death Consumption, sometimes concealed by a proposer under such terms as "Bronchitis," "Inflammation of the Lungs," or "Childbirth," is by far the most frequent. Should the proposer be young and have lost a near relation from this disease, it is customary to add five years to the age. Since, however, Consumption is a disease affecting principally the earlier years of life, Offices are disposed to regard a life of this kind over 40 years of age with greater leniency, and to forego the extra. Where both parents of the proposer have died of Consumption, the risk is considered a speculative one, and hence generally declined, though in cases where two brothers or sisters, or a parent and a brother or sister, have so

died, the additional risk may be met by an addition of seven or ten years to the age.

The third class of lives which Offices regard as being more or less hazardous are those pursuing such occupations as Butchers, the Retail Liquor Trade, Hospital Nurses, Plumbers, and Workers in certain Manufactures deleterious to health. The additions made to the premiums for lives whose occupations fall under one of the above descriptions vary not only with the particular form of occupation, but also with the age, general health, and, particularly, the habits of proposers. For persons engaged in the Retail Liquor Trade—a term which includes not only publicans and their employees, but brewers' travellers and stewards of vessels—it is the general practice to add a pound per cent. to the Annual Premium, though in special cases this addition may be reduced to ten shillings.

In addition to the three classes of Rated-up Lives just described, it is the rule of some Life Offices to charge an extra premium of five shillings per cent. to Female Lives at ages below 50, to cover the risks incidental to Childbirth.

The above remarks apply more particularly to assurances effected for the whole term of life, and for Endowment Assurance Policies require some modification. In this class of assurance it is usual in making a surcharge, on the ground of defective personal or family history, to add the same number of years to both the age at entry and that at maturity, the result of this process being that the extra premium is generally very trifling, even if as much as ten years be added. Hence, for these classes of lives it is a decided advantage both to the Office and to the Assured for the Policies to be effected under this method—to the Office because, the premiums being always of a substantial amount, the loss from premature death is less than under Whole Term Policies, and to the Assured because the additional premium bears a much less proportion to the ordinary premium than would be the case in an assurance for the whole of life.

To meet the objections which are held by some proposers against being surcharged, various schemes have been put forward by a considerable number of Life Offices, under which, subject to certain conditions, persons whose lives are regarded as second class, may be taken at ordinary rates. One Office, for example, accepts them without any addition under its Endowment Assurance Tables, with the proviso that in the event of death before the specified age is attained only half the sum assured becomes payable. A few Offices agree to treat these lives as first class upon the understanding that the bonuses shall be either deferred or reduced in amount. The most general method, however, of meeting the objections referred to is that known as the Contingent Debt method. This method, as well as the nature of the objections which it is designed to meet, have been well described by a distinguished Actuary lately deceased, Mr. A. W. Sunderland. In the course of a Paper on the subject, read before the Institute of Actuaries in 1891, he says:—"There is

a natural objection on the part of a man who proposes to insure his life to be requested to pay a premium at a rate higher than that which corresponds to his actual age. In addition to the pecuniary loss to him arising from the surcharge, there is also the stigma of inferior vitality stamped upon him as it were by the Office. In very numerous cases he resents the imposition of an extra premium and the reproach which the surcharge seems to convey, and a method of soothing his wounded feelings and relieving him from pecuniary damage if he should turn out a good life has been adopted by certain Offices. It consists in issuing the Policy at the ordinary rate of premium, but making a temporary deduction from the sum assured, so that, in the language of Friendly Societies, the man does not enter upon full benefit until after the lapse of a specified period, reckoned from the issue of the Policy. The deduction from the sum assured may remain fixed until the period expires, or it may fall by equal decrements within the period until it is extinguished at the end of it. Other modifications are occasionally introduced, as, for instance, that no bonuses vest until the expiration of the period. The plan most frequently adopted is to make a deduction from the sum assured, which decreases uniformly throughout the expectation of life, at the end of which it is extinguished."*

An example of this method is given by one of the Offices adopting it as follows:—Suppose a person aged 30 next birthday, whose expectation of life is 35 years, and who would in the ordinary way be rated-up seven years, to be accepted as a first-class life under the "Contingent Debt System." He would accordingly pay the tabular rate of premium for age 30, but the sum assured would for 35 years be subject to either a constant debt of £19 per cent. or a debt commencing at £36. 15*s.* per cent. and diminishing each subsequent year by £1. 1*s.* per cent. At the expiration of this period the full sum assured would attach to the Policy.

Another way in which the amount of the diminishing debt is calculated is to base it upon the difference between the ordinary and rated-up premiums. At age 30 charged at 37 this difference would be about half the amount in the above example, the debt consequently starting with about £18. In his Paper on the subject, Mr. Sunderland has shown that the correct initial and subsequent deductions from the sum assured are considerably more than are actually adopted by Offices, and that hence the practical application of the system is not based upon strictly scientific principles.

From what has already been said on the subject of Rated-up Lives, it may be very properly inferred that the leading principle upon which they are for the most part treated by Life Offices is that of regarding them as practically equivalent to lives 3, 5, 7, 10, or even more years older than themselves. In fact, for all purposes, such as the calculation of reserves, surrender-values, paid-up policies, or bonus options, they are placed by most Offices in precisely the same position as lives which have actually entered at

(41) *J. I. A.* xxix., p. 420.

the rated-up ages. It has, indeed, been held by some eminent authorities that for surrender values the lives should be treated as select, and hence as though they had not been surcharged, but this we believe is in practice rarely followed.

It not infrequently happens that after a Rated-up Life has been assured for a number of years, application is made to the Office for either reduction or removal of the surcharge, the applicant considering that, since after a considerable interval has elapsed he still enjoys good health and exhibits no sign of organic disease, it is no longer just or right that he should be compelled to continue paying the extra premium originally charged. Such applications are, however, it is almost unnecessary to say, almost invariably rejected, unless it can be clearly proved that a mistake had been made by the Office. The reason for this is obvious, having regard to the principles upon which the surcharge has been made. These lives, like all others, are subject to the law of average: some die early and others survive their expectation. The experience of Offices has repeatedly shown that a much heavier rate of mortality prevails among this class of lives than among those taken at the ordinary rate of premium. Hence, if the more fortunate of such lives were to be remitted the extra payment merely on the ground that they had not died prematurely, there would be no compensation to the Office in respect of the additional death-rate experienced by those lives who had been less fortunate. It is the basis of Life Assurance that those who live long must pay for those who die early, and this principle applies no less fully to Rated-up Lives than to those considered to possess an average prospect of longevity.

CHAPTER XVI.

THE COMPARATIVE RISKS OF OCCUPATION.

The subject of the influence of Occupation upon longevity is one that, particularly during the last half of the present century, has been discussed by various writers on statistics. In the earlier investigations, however, owing to the imperfect nature of the data upon which they were based, theories were deduced which have subsequently been proved to be either partly or wholly fallacious. It was not, indeed, till the publication of the Supplement to the Registrar-General's 25th Annual Report that statistics of any weight were capable of being used for such a purpose. In this Supplement, together with the subsequent ones issued at decennial intervals, Dr. Farr and his successors, Drs. Ogle and Tatham, have by their labours in this direction thrown a considerable amount of light upon the subject.

In his first Supplement, Dr. Farr based his conclusions upon the numbers living in 1861 and the deaths in 1860 and 1861; and in his second Supplement, partly upon the numbers living and the deaths in 1871, and partly upon a combination of the two sets of facts. Dr. Ogle's calculations, ten years later, were based on the census population in 1881 and the deaths in three consecutive years 1880-2. In Dr. Tatham's Supplement, dated 27th May, 1897, he sets out the details of mortality in the three years 1890-2, and in so doing, he compares the results of recent experience with those of the experience of earlier years.

In Dr. Farr's two Decennial Supplements, the mortality of men engaged in several industries was considered in relation to age only, no attempt being made to treat of the causes of death. In dealing with the mortality of 1880-2, however, Dr. Ogle was successful in making such an attempt. The magnitude of the task deterred him from classifying the causes of the total deaths in the three years in combination with occupation and ages, but as an alternative he abstracted from the registers "considerable samples" of the causes of death in several industries, and divided out the total mortality of each industry among these causes according to the proportions existing in the respective samples. In this way he was able to prepare his valuable Tables on "Causes of Deaths of Males in Different Industries," which illustrated his Report. When, however, he made arrangements for the preparation of an analysis of the mortality

during the period 1890-2, he became so strongly impressed with the necessity of securing the widest possible basis of fact for the elucidation of questions relating to such mortality, that he determined to face a task, which he had previously regarded as impracticable, but which, owing to his resignation of the position he held at Somerset House in 1893, was eventually carried out by his successor, Dr. Tatham.

The data upon which this last investigation was based consisted of the age, occupation, and registered cause of death of every male over 15 years of age who had died in England and Wales during the period observed. The female sex was excluded, mainly for two reasons—first, the uncertainty attaching to the statement of female occupations, both in the census returns and in the death registers; and secondly, the fact that while 94 out of every 100 males at these ages were returned as following more or less definite occupations, only 38 out of every 100 females at the same age were so returned. The causes of death were classified under 24 headings—Influenza, Alcoholism, Rheumatic Fever, Gout, Cancer, Phthisis, Diabetes, Diseases of Nervous System, Valvular Disease of Heart, Aneurism, other Diseases of Circulatory System, Bronchitis, Pneumonia, Pleurisy, other Diseases of Respiratory System, Hernia, Diseases of Liver, other Diseases of Digestive System, Bright's Disease, other Diseases of Urinary System, Plumbism, Accident, Suicide, and other Causes. The mean population of males over 15 years of age in 1891 was taken as 8,981,109, of which 8,464,045 were returned as following definite occupations, the remainder being returned as unoccupied. The total number of deaths during the three years under observation was 504,923. The occupations in which the causes of death were analyzed were 99 in number, the hundredth, which included 1,069,622 males, being headed "Other Occupied Males."

In addition to analyzing the causes of death in the 99 different occupations, Dr. Tatham found the "Comparative Mortality Figure" for each occupation. He took the number of males living between ages 25 and 65, and, by dividing these into four groups of decennial ages, he found in each group the number out of which 1,000 deaths would occur in a year, the total number during the whole of this period being 61,215. Hence, the "Comparative Mortality Figure" in each occupation bears the same ratio to 1,000 as the rate of mortality in such occupations is to that of all males living during the above period of age. "The Comparative Mortality Figures of occupied and unoccupied males between 25 and 65 years of age," says Dr. Tatham, "are 953 and 2,215 respectively. That is to say, the number of males of definite age-constitution within these limits that would give 1,000 deaths among the general population would give 953 deaths among occupied and 2,215 among unoccupied males. The Comparative Mortality Figure of unoccupied males, therefore, exceeds that of occupied males by 132 per cent."

From the list of occupations exhibiting the "Comparative Mortality Figure" against each, which is appended to this Chapter,

it will be seen that the lowest place of the whole body of men employed is taken by the clerical profession, which, for this purpose, includes not only the clergy of the Church of England, but also Roman Catholic Priests and Nonconformist Ministers. The mortality in this class from Phthisis and Respiratory Diseases is represented by figures which are respectively only 36 and 31 per cent. of the average of all classes. On the other hand, the clergy experience more than double the mortality from Diabetes, and one-and-a-half times the average from Rheumatic Fever. They suffer slightly more than do occupied males from Influenza, and also from Diseases of the Digestive Organs other than the Liver. Among local Diseases, affections of the Circulatory System are collectively the most frequent cause of death among this class.

The Diseases most prevalent in the legal profession, which for this purpose is restricted to Barristers and Solicitors, are those of Influenza, Cancer, Nervous Diseases, Diseases of the Liver, Bright's Disease, and Diabetes, the mortality from the last-named being four times the average and higher than that of any other occupation in the list. The profession suffers less severely than the average of occupied males from Phthisis, Heart Disease, Lung Disease; while their mortality from Accident is also below the average.

In the Medical Profession the "Comparative Mortality Figure" is, it will be seen, slightly higher than the average, there being only three main causes of death in this class which show a lower proportion than those in the general male population, viz.:—Phthisis, Diseases of the Respiratory System, and Accident. On the other hand, the mortality from Diseases of the Liver, and of the Circulatory and Urinary Systems, as well as from Suicide, appears to be greatly in excess, whilst that from Diabetes and Gout is more than three times as heavy as among the general male population. It is a remarkable fact that among members of this, as well as of the Clerical and Legal Professions, Diseases of the Heart are the most frequent of all causes of death.

Among Commercial Travellers the mortality is nigh, considering the nature of their employment and the large proportion of time they spend in the open air. Diseases of the Liver, Alcoholism, Diabetes, Cancer, and Bright's Disease, are particularly prevalent as the causes of death in this class, which, however, suffers less from Phthisis and Diseases of the Respiratory System than the average male population.

The mortality of persons directly engaged in the supply of spirituous liquors still continues to be enormous. The mortality of Brewers exceeds that of occupied males by about 50 per cent., that from Alcoholism and Gout being more than three times as high, and from Diabetes, Liver Diseases, and Bright's Disease, fully twice as high as the average. The mortality of Publicans between the ages 25 and 45 is just double the average, as well as higher than that of occupied males for every single cause with the exception of Accident. Taken generally, Publicans die "7 times as fast as do occupied males

from Alcoholism, 6½ times as fast from Diseases of the Liver, 6 times as fast from Gout, and more than double as fast from Diseases of the Urinary System, from Rheumatic Fever, from Diabetes, and from Suicide."

Turning to the shopkeeping class, we find causes of death varying according to the particular occupation and nature of locality with which we are dealing. For example, with Chemists and Druggists the mortality from Suicide is more than double that among occupied males generally, while from Rheumatic Fever they die nearly twice as rapidly, and from Gout 4½ times as rapidly as do occupied males. Among Tobacconists the mortality from Diabetes is double as high as it is among occupied males, and higher than in any other occupation in this class. Among Dairymen, with the exceptions of Phthisis and Nervous Diseases, the mortality under all the headings of the Table is in excess of the average, Gout and Suicide being double the proportion of occupied males. Fishmongers and Poulterers show a very high mortality from Alcoholism and an excess of the average from Rheumatic Fever and Gout. Among Fruiterers and Grocers Diabetes appears to be a very prominent cause of death. Drapers die faster than the average from Phthisis, Influenza, Rheumatic Fever, and Diabetes, by proportions ranging between 35 and 41 per cent. The death rates of Ironmongers are generally below the average of occupied males, this being especially noticeable under the heading of Phthisis; on the other hand, the deaths due to Alcoholism and Liver Disease exhibit a mortality of 73 per cent. above the average.

Among Butchers the mortality is generally very high, exceeding as it does that of occupied males under every heading. That due both directly and indirectly to Intemperance is described by Dr. Tatham as "appalling," the proportion of deaths from Alcoholism being more than half as much again as it was ten years previously. Butchers die much faster than the average from Rheumatic Fever, Gout, Diabetes, and Cancer. Bakers die somewhat less rapidly than do occupied males generally from Alcoholism, but much more rapidly from Diseases of the Liver, their mortality from Rheumatic Fever, Diabetes, and Urinary Diseases, being considerably above the average. Hatters, Shoemakers, and Tailors show very high mortality figures from Phthisis.

In the various occupations connected with the Metal Working Trade, those of Cutlers and File Makers attain an unenviable prominence in the exceptionally high mortality which prevails amongst them. In both these occupations the mortality from Phthisis and Diseases of the Respiratory System is very heavy owing to the irritation caused by the mechanical particles produced during the process of manufacture, and received into the lungs with the air in respiration. File Makers die even more rapidly than they did in 1881, from Diseases of the Circulatory and Respiratory Systems, while a common form of complaint from which they suffer is Chronic Lead Poisoning. The lowest mortality figure in this section is that

of Blacksmiths, this being particularly the case with regard to deaths caused by Phthisis, Intemperance, and Suicide.

In the Building Trades the occupations of Plumber, Painter, and Glazier show the highest mortality not only in a general way but at every age-group. These workers suffer very severely from Lead Poisoning, which is the main cause of the excessive death-rate in this class. The occupation of Plumber is also subject to an undue mortality from Phthisis, Cancer, and Rheumatic Fever. In the Manufacture of Glass there is a marked excess of mortality due to Phthisis and Diseases of the Respiratory Organs as well as to Alcoholism and Nervous Diseases, which are nearly double the proportion of occupied males.

In the Coal Mining Industry the "Comparative Mortality Figures" vary according to the particular district in which it is carried on. The highest mortality appears among the Colliers of Monmouthshire and South Wales, and the lowest among those of Derbyshire and Nottinghamshire. In the former districts, too, the Accident mortality during the three years observed was far above that of other districts, and nearly three times that of the two last-named Counties. Colliers generally appear to be particularly free from Phthisis, their mortality from this disease being scarcely more than half the average of occupied males. They are also remarkably free from Alcoholism. Dr. Tatham shows, by a comparison between the Statistics of 1881-90 and those of the previous decennium, that the mortality of Colliers from Accident has fallen at all ages, and especially so at ages under 45.

Costermongers and Hawkers, as well as General Labourers in the London District, and Chimney Sweeps, are shown to be a very unhealthy body of men, the diseases most prevalent among these classes being those of the Respiratory, Circulatory, and Urinary Systems, and Phthisis. The first-named class exhibits an extremely heavy mortality from Alcoholism, which has doubled since the previous observations. The "Comparative Mortality Figures" of London Labourers exceeds the average among occupied males in London by 23 per cent., and of occupied males generally by 48 per cent. Chimney Sweeps die more rapidly than do occupied males from Alcoholism, Phthisis, Suicide, and Diseases of the Heart, Lungs, and Kidneys. But it is with respect to their exceptional liability to malignant disease that this last-mentioned class is deserving of special notice, there being no other occupation in the list in which the ravages of Cancer at all approach the Mortality Figure from this cause in Chimney Sweeps, a peculiar form of the disease being known as "Sweeps' Cancer." Although, however, the mortality from this disease among Chimney Sweeps is still so extremely heavy, a comparison with the figures of 1880-2 shows that the proportion of deaths from this cause is little more than half that of the earlier period.

Among causes of death of occupied males generally Phthisis and Diseases of the Respiratory Organs are most excessively fatal

both in London and in the Industrial Districts. "In London," says Dr. Tatham, "the proportional excess from Alcoholism, Gout, Cancer, Phthisis, Diseases of the Respiratory and Urinary Systems, and from Suicide, is greater than that from all causes. In the Industrial Districts the excess of general mortality is exceeded only by that of Alcoholism and by that of Diseases of the Nervous and Respiratory Systems. In the Agricultural Districts Alcoholism and Diseases of the Respiratory Systems are barely more than half as fatal as they are among all occupied males, while Phthisis is 27 per cent. below that standard."

This Chapter may be fittingly concluded by quoting the substance of Dr. Tatham's remarks in the First Part of his Report on the subject of the two great scourges which, more than any other specific disease, afflict human life in this country, viz., Cancer and Phthisis.

With regard to Cancer, we are told that in the recent decennium the mortality from this cause among both sexes was low up to age 25, and not high till after age 35. Among males between these two ages the mortality had increased since the decennium 1871-80 by 13 per cent., which was the lowest rate of increase observed at any period of life. Among females of the same ages the rate showed an exceptional decrease of 1 per million living, this being the solitary instance in which even the slightest abatement was apparent in the ravages of Cancer. Even this exception, however, was found to conform to the rule when the rates of the decennium 1881-90 were compared with those of 1861-70. The excess in the recent decennium as compared with its predecessor increased rapidly and progressively as the age advanced, reaching 44 per cent. for males between ages 55 and 75, and 30 per cent. for females over age 75.

The progress of Phthisis in the community, it is satisfactory to note, was found by Dr. Tatham to be of an opposite character, the aggregate mortality from Tuberculous Disease as a group having decreased continuously throughout the last three decennia. In the decennium 1861-70 the death-rate from this type of disease was 3,240 per million, while in that of 1881-90 it had fallen to 2,420 per million. In spite, however, of this decline in the death-rate, the aggregate mortality from Tuberculous Disease is still so heavy as to demand constant and watchful attention. Tubercular Phthisis, the most distinctive member of this group, caused in the recent decennium a mortality equal to 1,724 per million, this rate indicating a life-saving on that of 1871-80 equal to 392 per million living, and on that of 1861-70 equal to 751 per million. In the course of the 20 years ending in 1890 the "crude mortality"—or mortality calculated from the population and registered deaths without reference to sex and age—from Phthisis decreased by 30 per cent., the rate of decrease among males being 25 per cent., and among females 35 per cent.

From the year 1851 to 1865 the Phthisis rate of mortality was

greater among females than among males, although this difference gradually diminished as time went on. Since this latter date, however, the mortality has been uniformly in excess among males, and in the period 1871 to 1890 the excess of the male rate over the female rate was found to be greater than that of the female over the male rate in the previous decennium. From information obtained subsequent to 1890, it has been ascertained that a similar change in the sex incidence of Phthisis mortality is still going on. As had been the case in the period 1871-80, so also in that of 1881-90, the mortality from Phthisis showed a decline at each of the 11 age-groups in both sexes, with the single exception that in the latter period the rate among males over 75 was higher by 14 per cent. than in the former period.

In the appended Table will be found the Comparative Mortality Figures for different occupations of male lives from 25 to 65 years of age, as deduced by Dr. Tatham from the statistics derived from the Death Registers and Census Returns. This Table, however, can only be taken as a rough guide to forming a definite opinion on the Mortality of Occupations, since the Mortality Figures here given are merely aggregate ones covering a period of life extending over 40 years. For a more correct estimate the reader is referred to Dr. Tatham's Tables at quinquennial groups of ages in his Report to the Registrar-General.

COMPARATIVE MORTALITY FIGURES FOR ALL CAUSES

Of Males 25–65 years of age in different Occupations during the period 1890–2, the Standard for All Males being 1,000.

Occupation.	Comparative Mortality Figure.
Innkeeper (Industrial Districts)	2,030
Inn, Hotel Servant (London)	1,971
Innkeeper, Servant, &c. (Industrial Districts)	1,948
Innkeeper, Servant, &c. (London)	1,838
Dock Labourer	1,829
File Maker	1,810
Lead Worker	1,783
Inn, Hotel Servant	1,725
Potter, Earthenware Manufacturer	1,706
Innkeeper (London)	1,685
Innkeeper, Servant, &c.	1,659
Costermonger, Hawker	1,652
Innkeeper	1,642
Inn, Hotel Servant (Industrial Districts)	1,583
Coal Heaver	1,528
Cutler, Scissors Maker	1,516
General Labourer (Industrial Districts)	1,509
Glass Manufacture	1,487
Inn, Hotel Servant (Agricultural Districts)	1,446
Brewer	1,427
General Labourer (London)	1,413
Tool, Scissors, File, Saw, &c., Maker	1,412

Occpuation.	Comparative Mortality Figure.
Tin Miner	1,409
Manufacturing Chemist	1.392
Copper Worker	1,381
Wool, Silk, &c., Dyer	1,370
Seaman, &c.	1,352
Innkeeper, Servant, &c. (Agricultural Districts)	1,348
Slater, Tiler	1,322
Innkeeper (Agricultural Districts)	1,320
Chimney Sweep	1,311
Lead Miner	1,310
Nail, Anchor, Chain, &c., Maker	1,301
Carman, Carrier	1,284
Copper Miner	1,230
Gunsmith	1,228
Messenger, Porter (not Railway nor Government)	1,222
General Labourer	1,221
Transport Service	1,216
Musician, Music Master	1,214
Bargeman	1,199
Zinc Worker	1,198
Cotton Manufacture (Lancashire)	1,176
Stone, Slate Quarrier	1,176
Coach, Cab Service	1,153
Coal Miner (Monmouthshire and South Wales)	1,145
Cotton, &c., Manufacture	1,141
Metal Workers (generally)	1,128
Plumber, Painter, Glazier	1,120
Copper, Tin, Zinc, Lead, Brass, &c., Worker and Dealer	1,111
Hatter	1,109
Tallow, Soap, Glue, Manure Manufacture	1,109
Hairdresser	1,099
Butcher	1,096
Brass, Bronze Worker	1,088
Wood Turner, Cooper, &c.	1,088
Plasterer, Whitewasher, Paperhanger	1,087
Engine, Machine—Maker, Fitter, Millwright	1,087
Factory Labourer (undefined)	1,078
Gas Works Service	1,077
Law Clerk	1,070
Engine, Machine, Boiler—Maker, Fitter, Millwright	1,070
Coal Miner (Lancashire)	1,069
Milkseller, Cheesemonger, &c.	1,061
Bookbinder	1,060
Railway Platelayer, Railway, Road, Clay, Sand, &c., Labourer	1,055
Textile Manufacture (generally)	1,054
Coach, Carriage Maker	1,040
Mine Service	1,021
Draper, Manchester Warehouseman	1,014
Boiler Maker	1,006
Tobacconist, &c.,	1,002
Bricklayer, Mason, Builder	1,001
Currier, &c.	998
Wool, Worsted Manufacture (West Riding)	996
Tin, Tin Plate Worker	994
Wool, Worsted Manufacture	991
Tailor	989
Cabinet Maker, &c.	979

Occupation.	Comparative Mortality Figure.
Watch and Clock Maker, Jeweller, &c.	977
General Shopkeeper	973
Physician, Surgeon, General Practitioner	966
Fishmonger, Poulterer	963
Commercial Traveller	961
Building Trades (generally)	957
All Occupied Males	953
Coal Miner (Staffordshire)	952
Fruiterer, Greengrocer	946
Watch and Clock Maker	936
Miners (generally)	935
Rope, Twine, Cord Maker	928
Chemist, Druggist	926
Locksmith, Bellhanger, Gasfitter	925
Coal Miner	925
Saddler, Harness Maker	924
Silk, Satin, &c., Manufacture	921
Baker, Confectioner	920
Shoemaker, Bootmaker	920
Commercial Clerk	915
Blacksmith, Whitesmith	914
Coal Miner (West Riding)	912
Paper Manufacture	904
Tallow, Soap Manufacture	897
Maltster	884
Carpet, Rug Manufacture	873
Shopkeepers (generally)	859
Other Occupied Males	847
Fisherman	845
Corn Miller	845
Publisher	833
Railway Guard, &c.	825
Barrister, Solicitor	821
Railway Engine Driver, Guard, &c.	818
Railway Engine Driver	810
Ironmonger	807
Coal Merchant	803
Engine Driver (not Railway, &c.)	786
Carpenter, Joiner	783
Railway Official, Clerk	781
Artist, Engraver, &c.	778
Wheelwright	778
Coal Miner (Durham and Northumberland)	774
Ironstone Miner	775
Sawyer	768
Domestic Indoor Servant	757
Tanner, Fellmonger	756
Brick, Tile Burner	741
Coal Miner (Derbyshire and Nottinghamshire)	727
Shipwright	713
Lace Manufacture	709
Hosiery Manufacture	698
Hosiery Manufacture (Leicestershire and Nottinghamshire)	696
Labourer in Agricultural Group	666
Grocer	664
Agricultural Labourer	632
Agriculturist (Agricultural Districts)	613

Occupation.	Comparative Mortality Figure.
Schoolmaster	604
Agriculturist	602
Farmer, Grazier	563
Gardener, &c.	553
Clergyman	533
Farmer, &c. (Agricultural Districts)	506
Artizan undefined)	399

CHAPTER XVII.

MODERN DEVELOPMENTS AND IMPROVEMENTS IN THE PRACTICE OF LIFE ASSURANCE.

In the course of our historical review of the progress of Life Assurance since it first began to attract the confidence of the general public in this country, we have seen that this progress naturally resolved itself into different periods. First, we had the period of "Speculative Assurances," in which the gambling element, never more prominent and universal than in those days, played a conspicuous part in the assurance of human life. Then came a reaction, and the more practical and scientific side of the subject gradually asserted itself: this period we have called the "Transition Period." During the third period, which may well be considered the "Golden Age" of Assurance Companies, a not inconsiderable number of Life Offices were established on sound principles, some of which are existing at the present day. These, however, were followed in the next period by a very large number of "Bubble Companies," brought into existence by means of the Act of 1844, which, as might be expected, enjoyed an ephemeral existence, and either entirely disappeared or became amalgamated with other and stronger companies. During the fifth period, under the wiser provisions of the Act of 1862, such companies were no longer formed, and their gradual disappearance led the way to a period when Life Assurance Companies should be placed upon a basis of sound financial principles. This period commenced, as we have seen, in the year 1870, when the Life Assurance Companies Act was passed and immediately came into operation. The sound principles, inculcated by this most important Statute, have year by year during this last period permeated the whole business of Life Assurance, and have consequently shown themselves in the various developments and improvements which have been effected in the practice of Life Offices, not only in this country, but throughout our whole empire.

The particular improvements in practice of which we shall speak in this chapter are of two kinds: (1) The increased liberality in the Conditions of Policies, and (2) The extension of Life Assurance in various directions to meet every form of contingency dependent on human life.

The first of these improvements may be classified as follows :—

1. The extension of Free Limits for Travel and Residence and the Reduction of Extra Premiums.
2. The recognition of Suicide as not necessarily avoiding a Policy.
3. The introduction of Indisputable Policies and of Non-forfeiture Conditions.
4. The treatment of Discontinued Policies.
5. The grant of Intermediate Bonuses to Claimed Policies.
6. The immediate payment of Claims on Proof of Death and Title.

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1. The Extension of Free Limits for Travel and Residence and the Reduction of Extra Premiums.

The more liberal conditions included in the above heading have proved to be of great advantage to all classes of Assured. The number of persons who either emigrate to our Colonies and the United States, or have business in different parts of the globe, or who seek foreign climes for the purpose of recreation, sport, and instruction, is one that increases yearly with the increased facilities for travelling. Some fifty years ago these limits were so prescribed that Policies became forfeited almost before their holders were aware that they had transgressed the conditions; or, if permission was applied for, the Extra Premium was such as to amount almost to annihilation of the value of the Policy. "The old free limits," says Mr. D. Deuchar, "included permission to sail to Ireland and the Channel Islands, and to ports on the Continent of Europe between the Elbe and Brest, or the Texel and Brest, or between Hamburg and Bordeaux. If the Life Assured desired to sail to Norway, Sweden, Denmark, Spain, or Portugal, it became necessary for him to obtain the consent of the Company, and to pay such Extra Premiums as the directors chose to impose."* These regulations were originally founded upon a belief in the uncertainty of risk arising from a change of climate, the extent of such risk not being understood so well then as it is at the present time.

If we examine a modern Prospectus of any Life Office, we find that the free limits for all Assured, except those of the seafaring class, have been extended to such portions of the world lying outside the Tropics; while for those Assured who, on effecting an assurance, state that they have never been, and have no intention of travelling, beyond these limits, a Whole-World License is usually granted free of charge. This last privilege is also extended to all ordinary Policies which have been five years in force, and the Assured under which have attained the age of 30 years, or even, with some Offices, a lower age. From this privilege, however,

* See Presidential Address delivered before the Actuarial Society of Edinburgh in 1887 and published in the Society's *Transactions*, Vol. ii., No. 5.

certain professions regarded as hazardous are excluded, the Extra Premium charged for residence beyond the ordinary free limits being regulated according to the circumstances of each case.

When for special reasons it is considered necessary to charge Extra Premiums, it is the general practice of Life Offices to reduce them to the lowest possible amounts, so as to barely cover the additional risk incurred by the Assured. These Extra Premiums vary in accordance with the nature of such additional risk, and range from 15*s.* or £1. per cent. for India to £5. 5*s.* per cent. for the West Coast of Africa, the climate of which is justly regarded by Offices as being about the most deadly in the world. Extra premiums are also charged for persons belonging to the Naval or Military Service. These, during time of peace, can be compounded for by the payment of a fixed Single Premium or of a small Annual Premium, covering all risks, payable either throughout the duration of the Policy or until permanent retirement from the Service. During war, however, those persons who have not thus compounded the extra Premiums incidental to the Services, are charged such an additional payment as, in the opinion of Life Offices, generally will cover the particular risks incurred. The Extra Premiums charged by Life Offices during the recent war in South Africa, to those Assured who were at the front, were at the rate of £7. 7*s.* per cent. for new assurances and £5. 5*s.* per cent. for existing assurances.

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2. The Recognition of Suicide as not Necessarily Avoiding a Policy.

In the last edition of this work, published three years before the Act of 1870 came into operation, the following passage, with reference to the practice of Life Offices as to the treatment of claims caused by Suicide, occurs:—"Formerly, in the event of an Assured life dying by Suicide (as also by duelling or the hands of justice), all interest in the Policy was lost to the personal representative of the person so dying; although in the case of a person holding, under a *bonâ fide* assignment, death from these causes, very properly, would not invalidate the Policy, provided notice of assignment had been given to the Office previous to the death. The improvement we have to note here is that some of the Offices—we think we may say the majority of them—are beginning to pay at least some consideration to the unfortunate families of persons dying by Suicide, and that the advantage is no longer entirely in favour of strangers. The Offices we refer to undertake to pay to the family (where the Policy has not been assigned) the surrender or Office value of the Policy on the day before death took place."

Since this was written, the practice of Offices with regard to Suicide claims has undergone a complete change, it being now the

general rule to treat such claims precisely in the same manner as ordinary ones, provided at least two full premiums have been paid. A few Offices, indeed, entirely dispense even with this condition, and hence undertake to pay such claims if they arise immediately after the Policies are granted. The object of these Offices in thus dispensing with any condition as to Suicide, is not so much a belief that the risk is comparatively infinitesimal as part of a general scheme for issuing their Policies free from all restrictions whatever. There seems no doubt that, judging from statistics, Suicides are on the increase, though whether this circumstance is in any way due to the more liberal practice of Life Offices is a matter upon which, of course, no opinion can be formed. On the whole, it may be truly asserted that the increased liberality of Offices in this respect has proved a blessing to the families of those persons whose deaths have arisen from this cause.

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3. The Introduction of Indisputable Policies and of Non-forfeiture Conditions.

The advantage derived from the application to Policies of Assurance of the above principles, when looked at from a commercial point of view, cannot be questioned. It must not, however, be assumed that such indisputability is entirely absolute, since in the event of it being proved, either during the existence of a Policy or after it has become a claim, that the assurance had been obtained by fraud, the Policy will, in spite of these principles, be declared void. In all Policies, too, in which the age of the life Assured has not been admitted at the commencement of the risk, and, has afterwards been found to be incorrectly stated, the contract must necessarily be revised in accordance with the Premium which would have been charged, had the correct age been originally given. Subject, however, to these exceptions, Policies which are granted on these principles are unchallengeable on any ground whatever, after the lapse of a period not exceeding five years.

The principle of non-forfeiture is applied to Policies which possess a surrender value. Such Policies, if affected by means of a limited number of premiums, either as Endowment or Whole Term Assurances, can be converted into Paid-up Policies for amounts bearing the same proportion to the original sums Assured as the number of premiums paid bears to the total number provided for in each Policy. Some Offices require a special application to be made by the policyholder before a Paid-up Policy of this description is granted; but others make the system automatic as soon as the days of grace have expired, while still allowing the Assured the privilege of reviving the original Policy within one year from the date on which the unpaid premium became due. Another form of this principle with regard to Policies, which, though lapsed, still possess a surrender value, is to apply this value to keep the Policy

in force till it is exhausted. Interest is charged on the outstanding premiums, which, as they are paid, increase the original surrender value. Not till the outstanding premiums and interest have amounted to the surrender value thus increased, does the Policy finally cease to exist.

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4. The Treatment of Discontinued Policies.

Policies may be discontinued in a variety of ways. They may be cancelled by the directors of the Company with which they have been effected, on the ground of fraud or wilful mis-statement, and, in such an event, the premiums paid by the Assured, though, strictly speaking, forfeited to the Company, are invariably returned. They may, when the assurance is of a limited character, such as for a term of years, against the life of some other person, against the birth of issue, or similar contingencies, expire when the object of the assurance is attained, and hence when the Policy is no longer required. The great majority of assurances, however, are discontinued by reason of the Assured not desiring to keep up their Policies, which are accordingly either surrendered to the Office in consideration of the payment to the lawful owners of their surrender values, or allowed to lapse through non-payment of the renewal premiums as they fall due.

Few changes in the practice of Life Offices during recent years have been so marked in their character or so advantageous to the Assured as the treatment of surrendered or lapsed Policies. The principle of the non-forfeiture conditions now-a-days attached to most Policies, which has already been referred to, affords every inducement to the Assured to prevent a Policy from lapsing. Policyholders are in other ways discouraged from discontinuing their Assurances. Some Offices are willing, on payment of a small fine in advance, to extend the days of grace ordinarily allowed for renewal, while nearly all undertake, on a simular payment being made, to revive lapsed Policies within a year of the date when the last unpaid premium has become due, without requiring any evidence whatever as to health. On these Policies, too, in respect of which two or more full premiums have been paid, and the title to which is absolute, Loans may be granted which are usually of sufficient amount to pay at least one outstanding premium.

As regards surrender values, the practice of Offices is, as we have already seen, of an equally liberal character. To all Policies not of the limited character referred to above, guaranteed minimum surrender values, in addition to the cash values of any Reversionary Bonuses to which they may become entitled, are, after the payment of three—in a few Offices even two—premiums, almost invariably attached. These surrender values, which are set aside after the Policies have lapsed, increase rapidly with the payment of each subsequent premium. They may also, should the Assured prefer

it, be converted into Paid-up Policies for amounts corresponding to those which could be purchased at the then ages of the lives Assured by Single Premiums representing such values. With some Offices, surrender values are, as has already been mentioned, applied to keeping Policies in force.

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5. The Grant of Intermediate Bonuses to Claimed Policies.

This practice is essentially of a modern type, having been introduced, we believe within the last twenty years. In former times upon a claim arising just immediately before the close of a valuation period the Policy would not participate in the surplus declared after such period, even if the full number of premiums, which would otherwise have entitled it to a share in the surplus, might have been paid. It was thus considered by Life Offices that the surplus was distributed on a principle resembling a Tontine system under which only the survivors at the close of the valuation period, which might extend over a period of three, five, seven, or in one or two cases even ten years, were entitled to claim a share. There was nothing unfair in the old method, so long as the Assured fully understood its practical effect, since the survivors, who might not unnaturally consider themselves as possessing a better right to a Bonus than those whose Policies had become claims, received a larger proportionate share than would otherwise have been the case. However, this circumstance had undoubtedly the appearance of a hardship on the families of deceased policyholders, and since it has been the general policy of Offices during recent years to remove as far as possible every ground of complaint from the operation of their assurances, it has been considered a wise and prudent course to introduce a system, which has been found to be popular and to work well in practice. It may be added that these Intermediate Bonuses are only a proportion, varying in amount with different Offices, of the Reversionary Bonuses allotted to the Policies at the last preceding Distribution of Surplus.

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6. The Immediate Payment of Claims on proof of Death and Title.

Up to about forty years ago it was the universal custom of Life Offices to defer the payment of the Sums Assured under Claimed Policies until a period of at least six months had elapsed after proof of death satisfactory to the Directors had been submitted. The reason for this was two-fold. In the first place, the calculations of premiums and reserves were based upon the assumption that all Claims became payable on the average in the middle of the year, that all premiums became due at the beginning of the year, and

that, consequently, in addition to the complete number of years provided for by the premiums accumulated at compound interest there was a further period of six months. In the second place, the Directors were influenced by a spirit of caution, due to not infrequent attempts at fraud by unscrupulous persons. In the earlier days of Life Assurance communications were not so rapid as they are now, and consequently it took much longer time to make proper enquiries into the *bona fides* of the claimants. This period of six months became reduced to three months, and has now practically disappeared altogether, Offices vying with each other to settle their claims with as great a promptitude as possible. As soon as evidence of death and proof of title are produced to the Office a cheque for the amount of the Claim is drawn and immediately forwarded to the claimant. In the case of matured Children's Endowments or Endowment Assurances, where as a rule no such proofs are necessary, it frequently happens that the Claims are settled on the very day upon which they become due. Although, unfortunately, frauds are by no means things of the past, we do not believe that they have been materially encouraged by the praiseworthy promptitude with which the settlement of claims is now effected, while, on the other hand, this improved practice has been of unquestionable benefit to the widows and orphans of deceased Assured, to whom in many cases the Policy moneys represent the whole or the greater part of the property they have left behind.

We will now pass to the consideration of those improvements in practice which relate to the extension of Life Assurance in various directions to meet every form of contingency dependent on human life. Here we discover that within the last thirty years innumerable schemes with this object in view have been originated and developed by the management of Life Offices. For many of these schemes the public are primarily indebted to the wholesome rivalry of the American Offices, the prospectuses of which contain a variety of plans so designed as to prove attractive to those persons who prefer a form of Life Assurance based more or less upon the Tontine System.

If we compare, by means of the Blue Books issued annually by the Board of Trade under the Life Assurance Companies Act, the various classes of Policies granted by Life Offices at the present time with those given in the earlier Returns under the Act, we shall be struck by the extraordinary growth of that class of Policy known as "Endowment Assurance." In 1889, this subject was investigated by Mr. A. E. Molyneux, who published the results of his enquiry in the *Journal of the Institute of Actuaries.** These results showed

* *J. I. A.* xxviii. p. 251.

that since the year 1876, while ordinary Whole Life Policies had increased in amount by nearly 30 per cent., Endowment Assurances had similarly increased to close upon 400 per cent. He also found that, from only one-and-a-half per cent. of the whole business transacted by Life Offices in 1876, this latter class of Assurances had risen to over five-and-a-half per cent. in 1889. Since this date Endowment Assurances have increased even more rapidly still, and in many Offices, especially those in which the average sums assured are comparatively small, they form by far the bulk of the new business obtained. One reason for the marked popularity for this mode of assurance during recent years is the extension by Offices to policy-holders of this class the privilege of participating in the periodical Distribution of Surplus. Another equally potent reason is the discovery by the public that these assurances combine with ordinary Life Assurance on easy and profitable method of providing for old age.

In many Offices Policies are granted which combine the advantages of Endowment Assurance with the cheapness of a Whole Life Policy. The principle underlying these Policies, which can be adapted to special needs in a variety of ways, is that of the payment of only half the sum assured at the specified age, the other half becoming payable on subsequent death, while in the event of death occurring before such specified age, the whole sum assured is payable. The method can be modified by making the whole sum assured payable at the specified age and one half on previous death, or *vice versâ*. Whichever method is adopted it is generally arranged for the premiums to cease on attainment of the specified age.

Under the two English Married Women's Property Acts, as well as under the Scotch "Policies of Assurance Act, 1880," Policies are issued which protect the family of an Assured from the claims of creditors, and consequently give them all the advantages of a settlement without the trouble and expense. It is as well, however, to point out that before such Policies are effected, the Assured should make themselves fully acquainted with their provisions, and should also satisfy themselves that the assurances are in the form actually desired. It cannot be sufficiently impressed upon this class of policyholders that by this means the sum assured is more or less locked up, and cannot without some difficulty be anticipated either by way of loan or surrender. For this reason Life Offices, while offering every facility for granting Policies under the above Acts, never encourage their issue except for substantial amounts and to persons who desire to effect them exclusively for the benefit of the wives and families. The sections of the above Acts which relate to these Policies are set out in Appendix B.

Policies may be effected, either under these Acts or in the ordinary manner, by means of which an income may be assured for a limited period, say twenty years, to the family of a deceased policy-holder. This can be done in the form either of a substitute for a payment of the sum assured or in addition to such payment at the

end of the specified period. By this method instead of £1000 being payable immediately at the death of the Assured an income of £50 per annum may be paid by half-yearly instalments for twenty years, at the expiration of which, when the children are all grown up, the need for such income ceases. Under the second of these two schemes the premiums for which are of course higher than for an ordinary assurance, the sum assured £1000 becomes payable upon the income ceasing. The special advantage of the first scheme is that of cheapness, the premiums averaging about three-quarters of those which would be required for the whole sum assured payable at death. In both these schemes the difficulty surrounding the appointment of a trustee and finding suitable investments are entirely obviated, while at the same time the family receive from the Assurance Office a regular income considerably in excess of the amount that could be obtained by the investment of the sum assured with a correspondingly high security.

Since the Finance Act of 1894 came into operation Life Offices have granted policies for amounts sufficient to meet the heavy Estate Duties which under the provisions of this Act become payable by the representatives of a deceased person immediately on his death.* As such payment has to be made to the Inland Revenue Authorities before either Probate of the Will or Letters of Administration can be obtained, and as interest accrues from the date of death, it is obvious that a great advantage attaches to an early settlement of this onerous but necessary charge on the Estate. This can now be effected by means of a special form of Policy under which the sum assured, in whole or in part, may be paid to the Commissioners of Inland Revenue as soon as satisfactory evidence of death has been produced to the Office.

Few subjects of a financial and social character have received within recent years a greater amount of public attention than that of Old Age Pensions, which, so far as its provision out of the taxes is concerned, is a problem that in spite of Royal Commissions, still remains unsolved. Yet, if Life Assurance were more general than it is, it would be found that by this means such Pensions could be placed within the reach of all who in their earlier years are in the receipt of a regular income, however small. After all, they are only another form of Endowment Assurance, a Pension being substituted for a lump sum down. For a long period Deferred Annuities, secured either by single or annual premiums, have been granted by the

* This Duty is payable at the following rate :—

Principal Value of the Estate.				Rate per cent.
Over £100	and not exceeding	£500	..	1
,, 500	,,	1,000	..	2
,, 1,000	,,	10,000	..	3
,, 10,000	,,	25,000	..	4
,, 25,000	,,	50,000	..	4½
,, 50,000	,,	75,000	..	5
,, 75,000	,,	100,000	..	5½
,, 100,000	,,	150,000	..	6
,, 150,000	,,	250,000	..	6½
,, 250,000	,,	500,000	..	7
,, 500,000	,,	1,000,000	..	7½
	over	1,000,000	..	8

National Debt Commissioners and the Post Office Savings Bank, as well as by the majority of Life Offices and Friendly Societies. These Deferred Annuities, which may commence at any specified age, are capable of being combined with ordinary Life Assurance, either by way of a return of the premiums paid in the event of death occurring before such age, or by an assurance of a fixed sum payable at death whenever it shall take place. Thus, for a premium but little more in amount than that for an ordinary Endowment Assurance, payable at the same age, an Assurance of £1000 can be obtained payable at death together with an annuity of £50 from the specified age until death.

Owing to the active competition which for some years past has existed between Life Offices of the ordinary type and Companies transacting business on the "Assessment" plan, the former have introduced various systems of Life Assurance by which the Annual Premiums are reduced to the lowest possible amounts. The form of assurance which, without possessing the drawbacks of the Assessment plan, approaches nearest to it in the lowness of the premiums required, is that generally known as the "Convertible Term" system. Under this system the largest possible immediate assurance is granted for the smallest outlay in premium. Each Office, however, which makes a special feature of this class of assurance, differs somewhat in the particular method which is described in its prospectus. One Office, for example, which may be regarded as the pioneer of the system, issues such Policies either for a uniform sum assured with a gradually increasing Annual Premium, or for a decreasing sum assured with a uniform Annual Premium. Other Offices grant a temporary assurance for a long term of years, which, before the expiration of a shorter term, may, by the payment of the premium for the assurance required at the age at which the conversion is made, be converted without further medical examination into a Whole Term or Endowment Assurance.

Another form of assurance of a different character, though based upon similar principles, is that known as the "Discounted Bonus System," which consists of an immediate reduction of premiums by means of the application of future estimated bonuses. Here, again, we find a difference in the practice of Offices undertaking this class of business. Some Offices, which reduce their premiums to what they call "Cost Price," provide that in the event of the future bonuses falling below the amounts estimated, the premiums are liable to be correspondingly increased, or else the sums assured reduced. Other Offices charge premiums slightly higher than the ordinary non-participating rates for Policies of this description, which are guaranteed to be absolutely free from any liability to either an increase of premium or a reduction of sum assured. As only a portion of the estimated profits is thus anticipated, these Policies will after a fixed period be entitled to share in the profits in the same way as ordinary Participating Policies.*

* See Discussion on a Paper on the subject, by Mr. G. F. Hardy, read before the Institute of Actuaries in 1894. (*J.I.A.* xxxi., p. 161.)

A third form of assurance, in which low premiums are the distinguishing feature, is that of "Deferred Life Assurance for Children." Assurances of this kind are granted to parents and guardians of children under 12 years of age without medical examination, but they do not vest until the age of 21 is attained. In the event of the assurance being discontinued either through death or surrender before it vests, the premiums are returned to the Assured. The advantages possessed by this form of assurance are (1) the rates of premium charged are on the average about one-third of those which would in the ordinary way be payable by a person whose life is assured between age 30 and 40; (2) no medical examination is required and, when the risk commences, lives cannot be surcharged or declined on the ground of deteriorated health; and (3) Policies are almost invariably issued free from all restrictions as to travel, residence, or occupation.

The non-requirement of a medical examination, which forms one of the features of the last-mentioned scheme, was also extended a few years ago by at least two well-known life Offices to adults who object to undergo such an ordeal. With these Offices it was sufficient for the proposer to make a declaration as to personal health, habits, and family history, and upon these being regarded as satisfactory an Endowment Assurance payable at an early age was granted. In one of these Offices, however—which, it may be mentioned, has since abandoned the scheme—this assurance did not vest for five years after it had been effected, the premiums being returned with compound interest in the event of death occurring during this period. The other Office gives an immediate assurance coupled with the stipulation that in the event of the sum assured being claimed by death the amount payable shall be only half that payable should the Assured survive the stipulated age.

Life Assurance without medical examination is also granted by the Government through the medium of the Post Office Savings Bank on the following conditions:—"Insurance from £5 to £25 inclusive may be effected without a medical examination upon production of satisfactory evidence as to health, but in such cases, if the insurant shall die before the second annual premium becomes payable, the amount of the first premium, and no more, will be paid to his representatives, and if he should die after the payment of the second annual premium and before the third premium becomes payable, half the amount insured, and no more, will be paid to his representatives. In either of these cases, however, if it shall be proved to the satisfaction of the Postmaster-General that the death of the insured person was caused by accident, the full amount insured will be paid. In any case, immediately after the payment of the third annual premium, the insured person is, of course, entitled to the full benefit of Insurance."

In some Life Offices in this country, and also in the Colonies, a special feature is made of what is called a Temperance Section. This Section is composed exclusively of policyholders who, at the

commencement of their assurance and also, as a rule, at the end of periodical intervals, varying from one year to five years, are required to make a declaration that they are strict Total Abstainers. In the event of their failing to make such declaration they are transferred to the General Section. In both these Sections the premiums charged are precisely the same, but otherwise they are kept entirely distinct from each other, separate accounts of receipts and expenditure being kept and a similar course being adopted as regards mortality experience and profits. As a rule, it happens that a much more favourable mortality experience, and consequently higher rates of bonus prevail in the Temperance Section as compared with the General Section. In a Paper read before the Second International Congress of Actuaries in 1898,* however, Mr. J. H. Richardson referred to the progress of the Temperance Section in the New Zealand Insurance Department during four successive periods of observation. On the first occasion it was found that no bonus had been earned in the "Temperance Section;" on the second the same rate of bonus was allotted to both sections; on the third the rate of bonus in the "Temperance Section" was slightly higher than in the "General Section;" while on the fourth occasion this result was reversed.

It may be mentioned that this subject was fully discussed some fifteen years ago at a Sessional Meeting of the Actuarial Society of Edinburgh. The general result of this discussion—which followed a Paper on the subject read before the Society by Mr. Alexander Ogilvie†—was that statistics such as those displayed in the Paper must be received with great caution, in view of the extreme difficulty of arriving at any sound conclusion from the available materials as to how far the apparent superiority of Total Abstainers in regard to longevity and immunity from sickness is to be ascribed to their being such, or to general conditions of which that circumstance is only one. It was pointed out that to arrive at any satisfactory results the experience of three classes would require to be compared—the third being composed of those who, while not Total Abstainers, were strictly temperate, and attention was also drawn to the fact that in regard to many of the statistics produced on the subject there was no evidence of their having been arrived at by scientific methods.

Although comparisons are repeatedly instituted by Temperance Reformers between the longevity of Total Abstainers and that of Non-Abstainers, no attempt has yet been made to deal with the subject upon a purely scientific basis. A true comparison between these two classes of lives can be made only by the construction of an authentic Mortality Table based on reliable statistics, and on due consideration of the Effect of Selection. And, until this is accomplished, no definite conclusions on the subject are of much value.

Another feature of Life Assurance which is to be found in all

* *Transactions of the Congress*, p. 202.

† A résumé of this Paper, which is not published in the Society's *Transactions*, may be found in the *Post Magazine*, Vol. xlvii., p. 17.

Offices is the facility with which Loans can be obtained in connection with Policies. Should the Policy form the entire security, the amount of the advance is usually from 90 to 95 per cent. of the surrender value, upon which it is a first charge. In the event of the interest charged for the Loan, which varies from 4 to 5 per cent. according to the practice of particular Offices, being unpaid, the Policy lapses, and the surrender value attaching it is applied by the Office as a set-off against such non-payment of principal and overdue interest. Hence, it is obvious that an Office can never sustain loss by making advances in this way, having always at its command ample security in the amount of surrender value attaching to the Policy. As to the treatment of Policies which have been discontinued either by non-payment of interest or in any other way, we may refer to our remarks upon the general practice of Offices under their non-forfeiture conditions. We may add that it has frequently happened that a temporary advance of this character has proved of considerable service to men of business who would otherwise have been obliged to have recourse to Loan Offices. A feature of a similar character is the grant of Policies under the Half Credit System, by which for a term, generally of five years, only half the ordinary premium is payable, the other half remaining at interest as a charge upon the sum assured. In the event of the arrears being still unpaid when the Policy is either claimed or surrendered, the amount is regarded as a Loan on the Policy and deducted from the sum assured or surrender value, as the case may be. It is customary under this system for the interest to be payable in advance.

Advances are also made by most Life Offices on Life Interests, Contingent Reversions, and on Personal Security in connection with their own Policies, which thus form a collateral security. As regards the last-mentioned class, however, a considerable amount of caution has to be exercised, since the Policy forms but a small part of the security. The principal security here is the personal guarantee of the borrower and the sureties, who must first satisfy the Office as to their *bona fides* and ability to pay up the instalments of the Loan, the interest, and the premiums on the Policy, when required to do so under the terms of the bond which they have executed. It is usual for the bond to contain provisions that in the event of any default being made in payment either of instalments, interest or premiums, the Directors reserve to themselves the right to call in the whole of the outstanding amount of the Loan; and also that, as far as the Office is concerned, the sureties are regarded as principals in every respect. Advances of this nature are frequently made to professional men for the purpose of purchasing a practice, and to men of business desirous either of entering into a partnership or of extending their business.

Among the many advantages which are derived from the modern development of Life Assurance, by no means the least is the statutory provision that was made in the year 1853, with respect

to the deduction of premiums from income for the purpose of estimating Income Tax. This provision is to the effect that any person who may have effected an assurance on the life of himself or of his wife with a Company that was either in existence on 1st November, 1844, or registered under the Act of 1844, is entitled to deduct from the amount of his income upon which Income Tax is chargeable any sums paid for premiums which do not exceed one-sixth of his total chargeable income. This provision, it must be observed, applies only to British Offices, it having been decided in the well-known case of Colquhoun *v.* Heddon that policyholders in Foreign Companies transacting business in this country cannot share this privilege. It is usual, however, we believe, for such Companies, in order to be on equal terms with British Companies, to make a similar allowance to their policyholders out of their funds.

Although the preceding description of the principal modern developments of the practice of Life Offices in this country is sufficient to illustrate the complete transformation that has taken place in such practice within recent years, it yet must not be considered as exhaustive. Hardly a year passes without some new scheme designed to meet the public requirements being introduced into general practice. We must, however, draw this chapter to a conclusion, and we cannot better do so, we think, than by quoting the closing words of an instructive address delivered by the late Mr. Benjamin Newbatt before the Insurance Institute of Yorkshire* —words which aptly sum up the general position of our subject.

"Life Assurance," he remarks, "which has ever been beneficial, has, with experience and under the influence of changing times, grown in fulness, in freedom, and in variety, and has now attained a degree of soundness, of elasticity, and of equitable perfection which entitles it to an equal place alongside the most stately and honoured of our monetary institutions. Its danger lies in the unwise war that, in too many quarters, and at too great a cost in money and sometimes in repute, is being waged for the sake of mere magnitude, which is quite as often a source of weakness as of strength, To whatever extent it allows itself to do this, it misses its true aim, which should ever be to give to its Assured the best value for their money, maintaining thereby its claim to the lofty eulogy of De Morgan, that 'there is nothing in the commercial world which approaches even remotely the security of a well-established'—and, may I add for myself? of a well-conducted—'Life Office.'"

* *Transactions of the Institute*, Vol. i.

CHAPTER XVIII.

ASSIGNMENTS OF POLICIES OF ASSURANCE.

If we take up any ordinary Life Policy and examine its provisions we find that the sum assured is invariably payable to "the executors, administrators, or *assigns* of the Assured." It is with this term "assigns," and the various conditions arising out of the claim of third parties to an interest in a Policy, that we now propose to deal in as brief and clear a manner as the circumstances connected with so intricate a subject will permit.

And, in the first place, the reader must disabuse himself of the idea that a Policy of Assurance can, like most other kinds of personal property, be transferred from hand to hand for the purpose of conferring a valid title to third parties. Such a Policy is what is called in law a "*chose in action*," that is, a thing of which the owner has not the possession, but which he has the right to recover by means of a suit or action at law.

In order, therefore, for a Policy to be transferred either permanently or temporarily to a third party, a document properly drawn up and stamped is necessary. The exact form and nature of such a document must depend entirely upon circumstances, and it will, in all cases where the transfer of the interest in the Policy is not intended to be absolute, be advisable that it should be prepared either by or under the advice of a solicitor.

There are two distinct kinds of Assignment, viz., Absolute Assignments and Assignments by way of Mortgage. The former kind is of a comparatively simple nature, a short statutory form for the purpose having been provided in the Schedule to the Policies of Assurance Act, 1867, which will be found in Appendix B. This form may be either endorsed on the Policy or drawn up as a separate document. It should contain the names of the assignor and assignee, the amount of the consideration money, and a full description of the Policy. It should bear the date of execution, the signature should be properly attested, and it should be stamped with an impressed stamp within a month of execution. In the event of the Policy being assigned as a free gift to the assignee, the words "in consideration of natural love and affection" or "for divers good causes and considerations," as the case may be, should be inserted instead of the amount of consideration money. In this latter case, provided the Inland Revenue authorities are satisfied as

to the *bona fides* of the Assignment, the amount of stamp duty is ten shillings; in all other cases it is at the rate of ten shillings per cent. of the consideration money.

With regard to an Assignment in the form of a free gift, it may be as well to point out that such a transaction is a "Voluntary Settlement" within the meaning of the 47th Section of "The Bankruptcy Act, 1883," which runs as follows:—"Any settlement of property not being a settlement made before and in consideration of marriage, or made in favour of a purchaser or encumbrancer in good faith and for valuable consideration, or a settlement made on or for the wife or children of the settlor of property which has accrued to the settlor after marriage in right of his wife, shall, if the settlor becomes bankrupt within two years after the date of the settlement, be void against the trustee in the bankruptcy, and shall, if the settlor becomes bankrupt at any subsequent time within ten years after the date of the settlement, be void against the trustee in the bankruptcy, unless the parties claiming under the settlement can prove that the settlor was at the time of making the settlement able to pay all his debts without the aid of the property comprised in the settlement, and that the interest of the settlor in such property had passed to the trustee of such settlement or on the execution thereof."

It must be added, however, that the possibility of a Voluntary Settlement of a Policy of Assurance being declared void can only occur during the lifetime of the settlor, the provision not being applicable after his death. Hence, while Life Offices are generally unwilling to pay Surrender Values or Cash Bonuses, or even to grant Paid-up Policies, to an assignee under a Voluntary Settlement within ten years of its date, they are not entitled to raise any objections to the payment of the sum assured to the assignee, in the event of the death of the settlor, being also the Life Assured.

When, however, we pass from the consideration of Absolute Assignments to that of Mortgages we are on more difficult ground, since the latter involve so many and varied interests. Hence we can only repeat that no attempt should be made to draft a form of Mortgage of a Policy of Assurance without the aid of a solicitor. Even with this aid, however, it not infrequently happens that Mortgage Deeds are incomplete in their covenants. For instance, such deeds, in addition to the usual covenants as to repayment of the principal and interest, and keeping the Policy in force, should contain provisions giving power to the mortgagee to surrender the Policy and also to exercise options in connection with the allotment of bonuses. The absence of these provisions in Mortgage Deeds frequently causes difficulties in the way of securing to the mortgagee all the benefits to which he might reasonably expect to be entitled. The Deed should be under seal and should be stamped at the rate of half-a-crown per cent. of the consideration money.

Assignments by way of Mortgage being invariably made in connection with a loan, it is necessary, when the loan is repaid and

the mortgagor wishes to keep up the Policy for his own benefit, for a Deed of Re-assignment to be executed by the mortgagee in his favour. It is usual for the Re-assignment to be endorsed on the Mortgage Deed, thus combining the two deeds in one document. Whether, however, the Re-assignment is made by endorsement or by separate deed, the original mortgage should be retained by the mortgagor, to be produced to the Office as part of his title.

A third way of dealing with a Policy not included in the above is by way of Equitable Mortgage. Documents of this nature are invariably under hand, and vary in character according to the circumstances for which they are needed. They are very frequently used by bankers to cover overdrafts in their clients' accounts, and also by wholesale dealers in connection with goods supplied on credit to retail tradesmen. They are of a much less formal character than Mortgage Deeds, being of the nature of a temporary lien or charge upon the Policy. The Stamp Duty for these documents is at the rate of one shilling per cent. upon the amount advanced, such amount apparently being reckoned as that actually outstanding at the time a balance between the two parties is struck.* In order, however, for Equitable Mortgages to become chargeable under this lower rate of Stamp Duty, it is necessary for them to be of the simplest possible character.

In whatever manner a Policy of Assurance comes into the possession of a third party, it is necessary for him, in order to render his title indisputable, to give notice to the Office granting such Policy that he either has had the Policy assigned to him, or has a charge upon it in consideration of an advance. "The Policies of Assurance Act, 1867," provides that on receipt of such notice in writing, and of a fee of five shillings, the Office shall record the notice and give a formal acknowledgment of its receipt. It is, however, quite optional on the part of the assignee to pay this fee unless he requires a formal acknowledgment. The usual practice is to send notice in duplicate with the fee, and for the Office to return the duplicate duly marked with an acknowledgment of the receipt of the notice. It is unnecessary to send with a notice of assignment or charge the document by which such assignment or charge is created unless for the purpose of proving the claimant's title. The importance of giving immediate notice of an assignment is increased by the provision under the above Act that "the date on which such notice shall be received shall regulate the priority of all claims under any assignment."

Assignments of Policies are sometimes made in connection with Marriage Settlements, and in such cases a valuable consideration arises by reason of the transaction being an ante-nuptial settlement. It is of great importance that the Settlement should be properly stamped for the full value of the property included, otherwise it may

* This is the view taken of Section 88 of the Act of 1891 regulating this Duty by Mr. Alpe, in his well-known work upon the subject. Whether the Inland Revenue Authorities accept this view we cannot say.

be liable to a penalty at some future time. The amount of stamp duty chargeable for the Policy alone depends upon the fact of the Settlement containing a covenant for keeping the Policy in force. If this is the case, the duty is at the rate of five shillings per £100 assured; but if there is no such covenant, then the duty is chargeable only on the then value of the Policy.* While on the subject of Stamp Duties, we may mention that within the last twelve years the Inland Revenue authorities have taken steps to secure their proper payment, imposing penalties not only on the parties interested, but also on the Offices themselves, in the event of non-compliance with the provisions of the Stamp Act by the former, and of making any payment on an insufficiently-stamped document by the latter. Hence it is not surprising that Offices have become more particular in their practice with regard to their recognition of the validity of documents constituting a chain of title of which they may have received notice.

In the event of the owner of a Policy becoming bankrupt, the Policy by operation of law passes without any Deed of Assignment first to the Official Receiver in Bankruptcy and afterwards to the Trustee on his appointment. Upon the bankrupt receiving his discharge, it is, strictly speaking, necessary for the trustee to execute an Assignment of the Policy; but, in most cases, Offices are satisfied with a letter from the Trustee stating that he has no further claim on the Policy.

Questions of title are, as a rule, considered by an Office, which has received notices affecting one of its Policies, only on its being required to make some payment either by way of claim, surrender, or cash bonus. At such a time the Office asks for all the documents of which from time to time it has received notice, and the non-production of any of which may cause inconvenience and expense. Upon production of the documents constituting the claimant's title a searching investigation is made into their validity before the Office is satisfied that the claimant is able to give a good discharge for such payment. Some Offices, on receipt of a fee, are willing to give a Certificate of Title; others, on the claimant paying the stamp duty, will, if requested to do so, grant a fresh Policy, on precisely the same terms as the old one, in which the claimant's title is clearly set forth.

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* Should the Policy have been effected concurrently with the Marriage Settlement, it would of course have no value, and hence, in the absence of any covenant for keeping the Policy in force, the Settlement need not be specially stamped. If, however, an existing Policy is included, the Surrender Value should be ascertained from the Office, and should form the basis of the *ad valorem* duty.

CHAPTER XIX.

THE RISE AND PROGRESS OF INDUSTRIAL ASSURANCE.

Under an Act of Parliament passed in August, 1896, an Industrial Assurance Company has been defined as "such body of persons, whether corporate or unincorporate, granting Assurances on any one life for a less sum than twenty pounds, as receives contributions or premiums by means of collectors at a greater distance than ten miles from the registered office or principal place of business of the company, and at less periodical intervals than two months."*

Companies transacting this class of business are, as compared with those of which we have hitherto been speaking, of quite modern origin. The germ of Industrial Assurance, however, may be said to date from the year 1807, when a scheme was set on foot for establishing an Office to be called "The Poor's Assurance Office." Under this scheme, which was to be worked by the machinery of the Post Office, Commissioners were to be appointed by the Crown to undertake its management, the persons to be entitled to its benefits being those "who subsisted wholly or principally by the wages of their labour." The scheme, however, after being referred to a Committee of the House of Commons, failed to secure sufficient support, and was consequently rejected.

It was not till the middle of the century that Industrial Assurance began to take root in this country. The first Company, started for the express purpose of transacting such business, is believed to have been the *Industrial and General*, which was established in 1849,† and which in 1852 was succeeded by the *British Industry*. This latter Company made rapid progress for some years, and in 1860 transferred its business to the *Prudential*, which, six years previously, had commenced granting Industrial Policies. At this period, it may be mentioned, the income of the *British Industry* was £25,000 per annum, while that of the *Prudential* was £18,000. Upon the latter Company taking over the business of the former, it changed its name to that of the *British Prudential*, again changing it in October, 1865, in connection with another amalgamation, to the *British Prudential and Consolidated Assurance Company*.

* 59 & 60 Vict., chap. 26, sec. i.

† It will be seen, on reference to Appendix A, that this Company was transferred to the newly-formed *People's Provident* in 1855, this latter Company being eventually wound up in 1872, in connection with the *European* disaster.

This last cumbrous title, however, had an existence of less than two years, and in April, 1867, the Company resumed its original title of the *Prudential Assurance Company*—a title which, with the addition of the word "Limited," made in 1881, on the Company being re-registered, it has retained up to the present time.

"The business of Industrial Life Assurance," says a writer in the *Post Magazine*,* "having been given a start, it rapidly took firm hold of the public, who were only too glad to avail themselves of the improved state of affairs. The success of the well-managed Industrial Offices naturally induced speculative promoters to turn their attention to Industrial Insurance as a field for operations. As a result, a number of Life Assurance Companies were formed, which had, either as their sole or principal object, the transaction of Industrial business. Most of them, however, were miserable failures. The creation of such companies was carried on with more or less activity up to the time of the passing of the Life Assurance Companies Act of 1870, which, as is so well known, required the promoters of each new Life Office to deposit £20,000 with the Government. This Act, of course, only affected the Industrial Companies in common with all Life Assurance Companies, but, judging from the resuscitations since 1870 of companies formed before that year in order to evade the deposit, there can be no doubt that the Act has had a very salutary effect in preventing a large number of Industrial Companies of mushroom growth being foisted upon the public."

The history of Industrial Assurance is, it may be asserted with truth, practically synonymous with that of the *Prudential*, which, owing to its rapid and enormous growth during the last quarter of a century, has taken the lead in all matters connected with this class of business. The earliest Industrial Tables published were those issued in 1854 by Mr. Edward Ryley, the Consulting Actuary to the *Prudential*. These Tables were eight in number, two being on the non-withdrawal system and six on the withdrawal. They were calculated for three distinct classes of assurance—Whole Life, Joint Lives, and Endowment Assurance. No life below ten years of age or above sixty was to be accepted. At age twenty the sum assured for a penny a week was £8. 11*s*., the principle of Industrial Assurance being that of adjusting the sum assured to a uniform scale of premiums instead of, as in Ordinary Assurance, the premiums to a uniform sum assured. One feature adopted by the *Prudential* in its early Policies was that of requiring a medical examination in all cases—a practice which has now been universally abandoned, partly owing to its expense and partly to the hasty and superficial character of which such an examination must necessarily partake.

The management, however, soon discovered that by limiting the grant of Industrial Policies to persons within these ages, they could not expect to make much progress. Hence, under the

* Vol. li., p. 568.

advice of their Actuary, the Tables were altered to commence at age seven next birthday, the same benefits being given at this age as at age ten. Subsequently, however, an "Infantile" Table containing rates for the insurance of the lives of children of all ages was issued, its application being at first confined to the Staffordshire Pottery District, as an experiment, and upon its success being established, gradually extended to other districts. At the same time it was also considered advisable to extend the age limit beyond sixty, and hence the Tables became applicable throughout life.

Under Section 28 of "The Friendly Societies Act, 1875," and also under the amending Act of 1896, it is provided that no Society shall insure on the death of a child under five years of age any sum of money which, added to any amount payable on the death of that child, by any other Society or branch, exceeds six pounds, or on the death of a child under ten years of age any sum of money which, added to any amount payable on the death of that child by any other Society or branch, exceeds ten pounds.

Provision is also made with regard to the payment of the sum assured only to the parents or guardians of the child, as well as for the grant of Special Certificates of Death by the Registrar, stating the amount of each Insurance, the object being the protection of children from the attempts of unscrupulous persons to secure their deaths by either direct or indirect means for the pecuniary advantage of themselves.

The extent to which insurances on the lives of children of tender age should be legalized has been on more than one occasion the subject of warm controversy; and, accordingly, before the above provisions were enacted, careful enquiry was made before Select Committees of the House of Commons as to their probable effect upon Infant Mortality. In the spring of 1889 a great deal of evidence on both sides was taken, expert witnesses being examined as to their experience before the Select Committee appointed in that year. The principal witnesses who were opposed to any form of Infantile Insurance were the Rev. Benjamin Waugh, Mr. Braxton Hicks, and Dr. Macdonald, M.P., the last two gentlemen being well-known London Coroners. None of these witnesses, however, were able to produce any statistics showing the comparative mortality between insured and uninsured children, their views being based apparently upon pre-conceived theories.

An important witness on the other side was Mr. T. C. Dewey, then, as now, one of the managers of the *Prudential*. In the course of his evidence he pointed out that at the younger ages the sums assured in Policies granted by his Office were much below the statutory limit, and that in paying claims the prospectus amounts were never exceeded. He also produced a Table, showing the annual rate of mortality per 1000 for ages 0 to 10, from which it appeared that, as compared with both the English Life Table No. 3 and the Carlisle Table, the rates of mortality in the *Prudential* were extremely favourable. Mr. Dewey suggested that it might be

advantageous to the community, if only one insurance for an amount increasing with each age were allowed, such amount being small to begin with, and also if not more than one Certificate of Death were granted by the Registrar.

In the following year a measure called the "Children's Life Insurance Bill" was introduced into the House of Lords by the Bishop of Peterborough (Dr. Magee), and evidence was taken on the subject of Infantile Insurance before a Select Committee of that House. Among those who thus came forward as witnesses were two Judges of the Queen's Bench Division—Mr. Justice Wills and Mr. Justice Day. The former of these judicial witnesses stated that while he would not prohibit Infantile Insurance, he thought it to be in some cases an evil. At the same time he admitted that in the majority of cases of cruelty to children which had come before him, the children were uninsured. Mr. Justice Day, however, gave an unequivocal opinion against the practice, which he would like to see prohibited altogether. Mr. Dewey again gave evidence, which was substantially the same as on the previous occasion. He added, however, proofs that lapses in the case of such Insurances were a cause of loss and not of gain to the Company. He also mentioned the fact that 94 per cent. of Infantile Claims paid by the *Prudential* were the only assurances which had been effected. Owing to the lamented death of the Bishop in May, 1891, shortly after his translation to the Archbishopric of York, the Bill was not proceeded with.

In the course of a Memorandum, written by the late Mr. Wm. Sutton, for the use of the Select Committee of the House of Commons already referred to, he makes the following observations upon the position of Industrial Companies at that time, *i.e.*, in 1888:—"A considerable number of Industrial Assurance Companies have been started during the last few years, but a critical examination of their accounts does not seem to show that they have, on the whole, been very successful. Shareholders' paid-up capital has, in some cases, completely disappeared, and in others it has become heavily charged with liabilities on account of such matters as 'preliminary expenses,' or 'extension of business expenses,' or similar items. In some cases, Companies that have been doing nothing for years past, but have been perseveringly kept on the Companies' Register since the passing of the Life Assurance Companies Act, have been got hold of by speculators in Industrial Assurance business, who have then commenced Industrial Assurance business, thus getting outside the provision of the Life Assurance Companies Act requiring a deposit of £20,000. I am not aware of the exact number of these Companies that are carefully kept alive on the off-chance of something being made out of them in this manner, but am of opinion the whole question well deserves consideration."

In the practice of Industrial Assurance there are several points in which it differs from that of Ordinary Life Assurance, and it is to these points that we shall now direct the attention of our readers.

The first, and perhaps the principal, difference between the two systems of Life Assurance is the mode in which the premiums are calculated and collected. We have already alluded to the rule prevailing throughout Industrial Assurance of adapting the sum assured to the premium instead of the reverse way, which is customary in Ordinary Life Assurance. The distinguishing feature in these Societies is that of Weekly Premiums, the sums assured being calculated upon the basis of how much can be secured for a penny a week and upwards. This feature involves a difference in the application of "loading," which necessarily takes the form of a reduction of the sum assured instead of an increase of the premium. In consequence of the much heavier rate of expense incurred by Industrial Companies in the collection of their premiums as compared with that of Ordinary Companies, the equivalent Annual Premiums for a sum assured of £100 are of course on a considerably higher scale in the former than is the case in the latter Companies. In fact it frequently happens that at some ages the Net Premium is doubled in order to bring out a workable Office Premium. A further cause of the high rate of Industrial Premiums is the large number of secessions which occur in the early stages of assurances, thus creating a loss to the Company which has to be compensated for by those who remain.

Another distinction between the two systems is the practice in Industrial Companies of granting Paid-up Policies instead of Cash Surrender Values, when it is desired to discontinue an assurance of some years' standing.

A third difference is the general absence of medical examinations in the grant of Industrial Assurances, the agent being relied upon to use his judgment and discretion before accepting a risk.

Again, in Industrial Companies Life Assurance is not infrequently combined with Sickness Assurance, and in this respect, as well as in the weekly collection of small premiums, these Companies are of a similar character to collecting Friendly Societies.

Lastly, the methods adopted under the two systems with regard to the Valuation of Liabilities are essentially different. In the case of Ordinary Life Offices it is possible, and indeed customary, to make a Net Premium Valuation according to a Standard Table such as the H^M in such a way as to obtain results approaching a degree of considerable accuracy; whereas, in Industrial Offices, the extremely short average duration of the risks, caused by the large proportion of secessions, combined with the fluctuating character of the mortality, especially of infantile lives, makes an estimate of the extent of a Company's liabilities very much a matter of guess-work. In Industrial Companies strict Net Premium Valuations are never made, the rule being to estimate the value of the Gross Premiums by means of the well-known Tables of Dr. Farr, and to make a deduction of from 30 to 45 per cent. from such values to provide for future expenses and profits.* In doing this it is necessary to take one precaution, and that is to exclude from the valuation

* To this rule, however, there are some notable exceptions. The *Prudential*, for example, while valuing their policies on infantile lives in this way, in dealing with lives above the age of ten, take credit for the H^M Net Premiums only. Another leading Industrial Office, too, applies the Net Premium Method of Valuation to policies which have been in force five years and upwards.

all Policies which by such a method are brought out as Assets instead of Liabilities. Policy Values of this kind, which are technically termed "Negative Values," must, if included, inevitably vitiate the whole results of the valuation. If reference be made to the Board of Trade Returns of the Valuations of the principal Industrial Companies, the sentence "no Negative Values are included" will generally meet the eye. Should they be included in the valuation, their amount ought to be expressly stated in the Valuation Balance Sheet, otherwise the Company is conducting its business on an unsound basis. To this rule, however, there is one exception, for which we have the high authority of Dr. Sprague.* Negative Values are permissible only in the event of an investigation into the rate of secession being made, and of the rate so found being combined with the rate of mortality. This, of course, involves considerable trouble and expense, and we are aware of only one instance in which it has been carried out.

The following figures relating to Industrial Assurance Companies are extracted from the latest Blue Book issued by the Board of Trade.

The number of Industrial Policies in force at the end of 1898, in the fourteen Companies transacting this business, was 17,857,134, assuring £172,651,445, which is an average sum assured of about £9. 13*s*. More than two-thirds of the Policies in force have been issued by the *Prudential*, the sums assured in this Company amounting to 126½ millions as against 46 millions assured by the other thirteen Companies. The total funds amount to nearly 18½ millions, of which sum over 14 millions stand to the credit of the *Prudential*. In this Company the ratio borne by the Commissions and Expenses of Management to the Premium Income was 41 per cent., while in the remaining Offices it averaged 50 per cent. Comparing the year 1898 with 1880, for which year the first official summary was made, it is satisfactory to notice that whereas the Premium Income in the former year is about four times that in the latter, the funds at the end of 1898 are twelve times the amount at which they stood at the end of 1880. This circumstance alone shows the greater stability of Industrial Companies at the present time in comparison with their position some twenty years ago.

We may fitly conclude this chapter with the views expressed many years ago on the future of Industrial Assurance Companies by Sir Henry Harben, the veteran pioneer in this field of Life Assurance.† "The success of Industrial Assurance," he remarks, "has been determined by a close attention to a variety of circumstances. In the first place, a more than ordinarily careful selection for out-door work must be made, the most constant supervision

* See Evidence at the Official Enquiry into the affairs of the *Royal Liver Friendly Society*, in the early part of 1886.

† See his Paper on the History of Industrial Assurance, read before the Institute of Actuaries in April, 1871.

must be exercised, and the closest attention to details must be used; but the chief success lies in a most stringent attention to the internal economy and to the method and regularity observed at the Chief Office. Without these two requisites the problem of Industrial Assurance cannot be solved; but with them the difficulty is entirely overcome, and the working-man can reckon with as much certainty on the results of his frugality and prudence as his richer and more fortunate employer."

CHAPTER XX.

LIFE ASSURANCE IN THE UNITED STATES AND THE COLONIES.

The progress of the principles of Life Assurance among the English-speaking races outside the United Kingdom has been, when compared with the mother country, essentially modern in character, since their development may be said to have taken place within the latter half of the century. Notwithstanding this fact, however, it may be asserted without fear of contradiction that these principles seem to be better understood, and to have obtained a greater hold upon the habits of the people of the United States and of our self-governing Colonies and Dependencies, than is the case in this country. Hence, we venture to think that a few remarks upon the main characteristics of Life Assurance as conducted in the vast Continents comprised under the above heading, will not be considered out of place in a work professing to be a guide and handbook to the Theory and Practice of Life Assurance.

In the United States the practice of Life Assurance originated in very much the same manner as in England. It will be remembered that the first germs of the principle have been traced to the action of the Mercers' Company, which, in 1698, promulgated a scheme for the benefit of widows of clergymen and others. This scheme, though unsuccessful, found imitators both here and in the New World—at that time an important part of our Empire. In 1759, the *Presbyterian Annuity and Life Insurance Company of Philadelphia*—the first Society of the kind established on the other side of the Atlantic—received a Charter from the hands of Thomas Penn, the proprietor of the Province of Pennsylvania. The Society, which confined its operations to the families of members of the Presbyterian Church, commenced business in the same year. Ten years later, the same Province saw the establishment of another Society based on similar principles, viz., "The Corporation for the Relief of Widows and Children of the Church of England in America." Its object was to grant Reversionary Annuities to the families of deceased clergymen, the rates of contribution being, at the instance of Benjamin Franklin, computed by the celebrated Dr. Price. In 1784, a Corporation was chartered in Maryland for the benefit of the Episcopal Clergy of that State. Owing, however, to the unsettled condition of the country for many

years subsequent to the War, the principles of Life Assurance were confined to these three Societies until the year 1812.

In this year Life Assurance received a fresh impetus by the establishment of a Life Assurance Company of a general character, also in Philadelphia, which has been called "the birthplace of American Life Assurance." This Company, styled the *Pennsylvania Company for Insurances upon Lives and Granting Annuities*, in the absence of American Mortality Tables, based its contracts on the Northampton Table. In 1818, the Pennsylvania Company was followed by the *Massachusetts Hospital Life Insurance Company*, which was an out-growth of the Massachusetts General Hospital, this institution possessing a monopoly of Life Assurance. The effect of such a monopoly was to retard the progress of Life Assurance for many years.

In 1840, Life Assurance was for the first time officially recognized by the State of New York, the legislation of which passed a law securing the benefit of Life Policies to wives free from the claims of their husbands' creditors. Between 1842 and 1846, six Life Assurance Companies, including the *Mutual of New York*, the *New York Life*, and the *Connecticut Mutual*, were established on a modern basis, and, from this period, Life Assurance in the United States, having secured a sure footing, began to develop with extraordinary rapidity. In 1850, two Companies were started on the "Temperance" plan, and the following year saw the beginning, first in New York and then in Massachusetts, of that elaborate system of State supervision which has since played so prominent a part in the history of Life Assurance both in the United States and Canada. Four years later Industrial Assurances became a prominent feature in American Life Offices. In 1859, the establishment of the *Equitable of the United States* on a mutual basis, marked the commencement of a new era, this Society being quickly followed by others of a similar character.

Up to this period many difficulties connected with the calculation of premiums for the risks undertaken by the companies had arisen, with regard to which a writer in the *Spectator*, one of the leading insurance papers in the United States, observes:—"The early companies began business under circumstances of peculiar embarrassment, arising from lack of local material from which to construct their plans. They possessed no complete or reliable statistics of American Mortality, and did not know whether the ratios of decrease of human life exceeded, fell below, or proximately conformed to those which had been ascertained to prevail in European countries, or how far they were modified by climatic, social, and other influences; and they were, for much the same reasons, nearly as much at sea when required to anticipate the rate of interest which could be relied on to prevail during any considerable period. Possessing neither of these indispensable factors of the then novel problem of life-underwriting, they prudently and wisely eschewed all pretence of originality, and got over the difficulty by adopting

in whole cloth the tables, computations, rates of premium, and, for a while, the methods of procedure and management used by English companies. Among these there was sufficient variety to enable their American imitators to gratify their diverse caprices. Some of them selected Tables predicting a very high rate of mortality, and used a low rate of interest in computing premiums; while others assumed a lower rate of mortality and a higher rate of interest. The effect was to produce premiums which did not differ very widely in amount, but in every case largely in excess of the companies' needs, the intention of the pioneer managers being to err, if at all, on the safe side; and it is due to them to admit that they succeeded. A few years' trial discovered the fact, which every prudently-managed company's experiences confirm, that the premium rates then adopted, and ever since substantially retained, were a great deal higher than absolutely necessary."*

The Mortality Tables at first adopted by companies in the United States were the Northampton Table, the English Life Tables, and the Seventeen Offices' (called in America the "Actuaries'") Table. In 1859, however, Mr. Sheppard Homans constructed a Table from the Mortality Experience of the *Mutual Insurance Company of New York*, to which, in 1868, he made considerable extensions. This extended Table, the character of which has already been described in the earlier portion of this volume, was soon recognized as the one best representing American Mortality, and, under the name of the American Experience Table, it rapidly superseded all others as the basis of calculation for Life Assurance purposes. As has already been mentioned, this Table became the standard Table in the State of New York in 1868, thus superseding the English Life Table, which had up to that period been the accepted standard. At the same time the rate of interest for valuation purposes was reduced from 5 to 4½ per cent. The American Experience Table subsequently became adopted by a number of States as a standard Table. At the present time, however, the standard Tables vary in different States, some of which prefer the "American Experience," some the "Actuaries' Table," while others have no definite regulations on the subject. There is also a variation in the rates of interest assumed in valuations by different States, some making 4½ per cent. and others 4 per cent., as a standard. Hence, as a result of this divergence in practice, it may sometimes happen that a company will be declared to be solvent in one State and insolvent in another!

We may here conveniently pause to record the views of prominent American actuaries and others upon the all-important subject of "State supervision" in its relation to the progress and development of Life Assurance in the United States In the course of a recent address by Mr. J. A. McCall,† in which the whole subject is

* This was written in 1883.

† Delivered before the 28th National Convention of Insurance Officials at Milwaukee, in September, 1898.

reviewed, he remarks: "State supervision in New York was begun in a mild form under the Revised Statutes of 1828, which required all moneyed corporations thereafter created to make Annual Reports to the State Comptroller. This provision was continued in the first general Insurance Act of April 10th, 1849, and compliance with its requirements by foreign companies was made a condition of their admission to the State. A deposit with the State for the protection of policyholders was first required by the Act of April 8th, 1851, and under this Act the Comptroller was given authority to make official examinations of companies. This Act also made the possession of a Re-insurance Fund a necessity, and required a company to be dissolved if its assets were not sufficient to re-insure its outstanding risks. The general Life and Health Insurance Law of 1853 required the companies to report a classified statement of all policies in force, together with the data necessary for an official valuation of Policy liabilities. The Act of April 15th, 1859, creating the Insurance Department, made no new requirement of the companies, but transferred to the Superintendent the authority over them formerly exercised by the Comptroller. A standard of solvency was first adopted by law in 1866, the English Life Table No. 3 for Males, with interest at 5 per cent., being chosen. In 1868, the standard was changed to the American Experience Table, with interest at 4½ per cent."

Mr. W. S. Nichols traces the origin of State supervision in the United States in the following manner: "Wild-cat banks had cursed the country. Two great fires, in 1835 and 1845, had overwhelmed our stock fire companies. Swarms of irresponsible mutual corporations had been organized in their place, whose rapid failures became a public scandal. The natural result of both was an attempt to remedy the defects in our financial institutions by legislation, whose cardinal feature was a sufficiency of funds in hand to balance outstanding obligations. The chief financial officers charged with the enforcement of these laws in two of our principal States soon found their task too heavy, and separate departments were created for insurance. Thus began our State supervision. By one of those seemingly unimportant accidents which sometimes determine momentous issues, the supervision of insurance in Massachusetts was soon entrusted to Elizur Wright, a former teacher of mathematics, and a man of undoubted genius, who had been prominent as a consulting actuary, and was a politician as well of pronounced and radical views. He found the laws intended to secure the proper management of insurance utterly worthless, and set about to correct the evil by what he conceived to be the only sound business rule. The practice of the companies must conform to their theory. The Tabular Net Premium must be applied according to the assumptions on which it had been computed, and the loading must be applied just as the theory called for. . . . . A doctrine so mercantile, so simple, and, in the main, so reasonable, proclaimed by a State official and enforced by legislation, coming at a time when

the questions of safety and dividends under a vigorous competition of new companies were paramount in the minds of an unenlightened public, and accentuated by failures abroad, was accepted with little protest."*

The subject of "State supervision" is, however, one upon which American actuaries are by no means agreed. According to Mr. George King, whose paper on "Legislation affecting Life Assurance Companies," read before the Institute of Actuaries in 1891,† contains the views on both sides of the question of leading Insurance men in the United States, it is distrusted and denounced by the majority as if it were the essence of evil. One of the few advocates of State supervision thus writes: "The thing which caused the failure of so many American companies, and which to-day prevents the establishment of new ones organized upon the proper basis, was not Government supervision, nor a fixed standard of solvency; but it was, and is, the expense account. The companies which failed had to buy business at such a price that it never could have sustained itself. . . . . In the light of history, and of the present situation, the inference is almost irresistible that the removal of Government supervision and of a fixed legal standard, or any reduction of that standard, would be at once followed by a new spurt in competition and a further increase in the expense account up to the limit of the new standard, or, if the standard were abolished altogether, up to the limits which make a sober man tremble to think of. . . . We began our experiment long ago. People have put faith in supervision, and ceased to watch for themselves, and that faith has, in great part, contributed to the rapid development of Life Assurance among us, and to the peculiar character of that development."

Another equally high authority on the subject, however, states his belief that "it is an unquestionable fact that not less than half-a-dozen companies in the State of New York alone, which, but for the interference of the State, were destined to a long career of usefulness, were destroyed by it." An American writer in the *Cyclopædia of Political Science*, also asserts that "the tendency of State supervision is to interfere injuriously with honest and well-conducted companies, and to afford but a feeble protection against those of a different class; to involve the State in the odium of evils which it is supposed to be its duty to prevent; to lessen the sense of responsibility among those who control the Offices, and the spirit of prudence and watchfulness among the public; and to place in the hands of public officials a power and influence which are apt to be abused, and which are always open to suspicion." Mr. King himself, too, gives sound arguments against the system of Government supervision, and shows from practical illustrations that a Net Premium Valuation, which, whatever may be the particular standard adopted in different States, is invariably applied to test the solvency of a company, may

* *Transactions of the Second International Actuarial Congress*, p. 162.

† *J. I. A.* xxix., p. 481. This Paper should be carefully studied by all who are in any way interested in this important subject.

in some cases prove an utterly fallacious guide to the true position of a Life Office."

The gradual adoption of the principle of State supervision over Insurance Companies in the United States has led to the passing of a large number of special laws on the subject by the Legislatures of the various States. The different provisions of these laws, which vary in character according to the particular State in which supervision is exercised, have been briefly summarized by Mr. James Chisholm in three particular groups.* In the first group he places those provisions intended to safeguard the supremacy of the State; in the second, those intended to ensure the *bona fides* and solvency of the companies, and to watch over their proper working; and in the third, miscellaneous regulations dealing more or less with matters of detail, or, at any rate, of relatively minor importance, and intended for the benefit sometimes of the Assured and sometimes of the company.

The principal requirements of the various States with regard to Life Assurance Companies are:—(1) The payment of certain fees and annual taxes; (2) the possession by the companies of a fixed amount of funds combined with a deposit of a portion of such funds with the States; (3) the filing with the Insurance Commissioner appointed by each State of the Annual Accounts and Statement of Business up to 31st December in each year; (4) the valuation of the company's risks according to the standard Mortality Table and Rate of Interest adopted by the particular State, such valuation to be made by the Insurance Commissioner, either of the State in which the company transacts its business, or of the State in which its principal office is situated; and (5) Annual Licenses for agents of the company.

The State in which Life Assurance is most prominent is that of New York, the chief requirements of which are:—(1) that the company shall have funds amounting to $100,000 in specified securities. and shall also deposit a similar sum with the State; (2) that there shall be Annual Valuations by the State Superintendent on the Net Premium basis according to the Table adopted as a standard by the company; (3) that the Accounts and Statements of Business shall be filed before 1st March in each year. This State also, in common with some other States, compels companies to grant Paid-up Policies after three Annual Premiums have been paid. Under Section 312 of an Act of this State, passed in 1898, it is provided that no company shall declare forfeited or lapsed any Policy, unless the same is a Term Insurance Contract for one year or less, by reason of non-payment of any premium, unless notice shall have been issued to the Assured at least fifteen or not more than forty-five days prior to the day when the same is payable, and, further, that no Policy shall be forfeited until the expiration of thirty days after the issue of such notice.

We will now pass in review very briefly the principal characteristics

* *J.I.A.* xxxiii., p. 336.

attaching to Life Assurance business in the United States, so that the reader may be in a position to compare them with those existing in British Offices. Two features particularly stand out in the practice of Life Assurance in the United States—the universality of the Non-forfeiture System and the high percentage of Lapsed Policies. The principle of the Non-forfeiture System was first recognized in the United States in March, 1859, when the Insurance Commissioners of the State of Massachusetts urged upon the Legislature the passage of a law to prevent the forfeiture of Policies for non-payment of premiums until the policyholders had been assured for the term equivalent to the value of the premiums previously paid to the Office. The efforts of the Commissioners were ultimately successful, and the Massachusetts law was passed in the early part of 1861, and soon spread through the whole of the United States. Many American companies print in their Policies a Table showing the term during which the full amount of the Assurance will be extended until its lapse. For example, one company guarantees to a policyholder, aged 30 at entry, the full Sum Assured, when five Annual Premiums have been paid, for 4 years 261 days after date of lapse; when ten Annual Premiums have been paid, for 9 years 298 days after such date; and when fifteen Annual Premiums have been paid, for 13 years 98 days. It will be observed that the application of this system is different from that usually adopted in this country, where it is the custom, and instead of keeping the Policy in force for the full amount for a limited term, to reduce the Sum Assured proportionally and make the Assurance a paid-up one for the remainder of the whole of the original term.

The high percentage of Lapsed Policies is perhaps one of the results of the Non-forfeiture System, since one of the effects of the System is to encourage a certain amount of laxity on the part of the Assured in the payment of his premium. On this subject Mr. G. H. Ryan, after a visit to the United States, made the following observations at the Institute of Actuaries:—"A feature of great importance in American business is the extraordinary proportion of Cancelments, that is to say, Lapses and Surrenders, annually taking place. From a Table published by one of the companies in New York, I find that in the year 1893 the company which showed the smallest amount of Cancelled Policies in the year had a percentage of $6\frac{1}{2}$ to the total Insurances in force at the beginning of the year. I give the figures roughly on this point, as they will be of some interest. The total Insurances in force of the company in the year 1893 were nearly 200 millions of dollars. The Lapsed and Surrendered Policies in the year amounted to nearly 13 million dollars, or $6\frac{1}{2}$ per cent., as I have stated. Now, this is the lowest percentage shown by any company; and in the cases of other Offices in America the percentage varies from this figure up to 20 per cent., a proportion which I venture to think is not readily conceivable in this country. The largest Offices in America show a percentage of discontinued of 10 or 12 per cent. of the total amount assured in

force at the beginning of the year. I imagine that in this country, even among the most progressive companies, 3 or 4 per cent. would be an unusually high rate."*

The main differences between the aspects of Life Assurance in this country and in the United States have been admirably described in a speech at the Institute of Actuaries by the present President, Mr. C. D. Higham, of which the following is a summary taken from the columns of the *Insurance Record* †:—"Across the water everything was big; their mighty rivers and vast inland seas all seemed to make bigness a principal idea, and therefore the bigness of Insurance Companies was thought too much of, because there were smaller societies—some of them with odd names—doing a very useful work. One noticed over there how much greater interest people took in Life Assurance than in this country. Everybody knew something about it there, and something of the different plans of the different Offices, and there was generally a greater activity in such matters. But it was not only that and the enterprise of the agent, or solicitor as he was called, which accounted for the pushing of business, but partly it would seem to be from the self-reliant habits of the people themselves. A man there did not seem to leave it to a father to provide for him, so far as he could see. He was prepared to make his own fortune and provide for his own family. That led, as he fancied, to two different classes: those who were going to 'make their pile,' as it was called, and who wanted Life Assurance simply as a temporary protection, and these took a Whole-Life Assurance, and let it go in the most casual way when it had served its purpose, or they got into the Assessment Companies. And there was the other class, which looked to Life Assurance not only for the Life Assurance part but for the saving too, and they took Endowment Assurances, but, with all their friends dealing in stocks and commodities, they wanted an element of speculation in their Policies, and found it in Tontines. It was confusing to a stranger that there were practically no prospectuses in the English sense of the word. They published little books about the different plans, as the railways did little pamphlets about the different lines. There was such a hurry there that no one had time to read a prospectus. A man only wanted to know the pith of it, and trusted a good deal to the personal explanation of the agent and his own information. He noticed a desire that nobody but a registered agent should attempt to secure Life Assurance business. That might suit over there, but it would be a strange thing here, especially with regard to certain Offices—one in particular, which got nearly half its business from the unpaid services of members and friends."

Turning from the English standpoint as to Life Assurance in the United States to the American, we may again quote the instructive Address of Mr. J. A. McCall on the subject of the modern practice of American Companies. "The old rivalry between companies,"

* *J. I. A.* xxxii., p. 45.
† Vol. xxxvii., p. 109.

he says, "as to the amount of the annual dividend—which was always contingent—has given way to a rivalry as to benefits which may be guaranteed in the Policy. The system of annual dividends has been superseded to a very large extent by long-dividend periods, with the options of continued Insurance or Cash Value at the end of the first dividend period. The option of Cash Value is also made available under many Policies at the end of other periods. This change had its origin, as we have seen, as far back as 1869, and it received a new impetus when the first 10-year Dividend Policies began to mature. In 1880 Massachusetts enacted the first Cash Surrender Value law, and the practice of guaranteeing Cash Surrender Values at definite periods was soon after adopted by most companies, even though annual dividends were continued. All companies now guarantee Cash Surrender Values. The companies which first adopted the Tontine system restored the Non-forfeiture Clause, and have been among the foremost in liberalizing the contract.

"Other new features introduced have had for their chief ends: (1) to relieve the policyholder from vexatious restrictions; (2) to assist him in keeping the Policy in force; and (3) to provide for its certain and prompt payment at maturity. The restrictions removed have been chiefly those relating to occupation, to residence and travel, and to the personal habits of the Insured. The usages of forty-two companies now doing business in the United States may be summarized as follows:—

"Residence and Travel.—The Policies of sixteen companies contain no restrictions upon residence or travel; six companies impose restrictions during the first Policy-year only; seventeen companies impose restrictions during the first two years of the Policy; one company imposes restrictions during the first three years of the Policy; and two companies make restrictions continuous.

"Occupation.—The Policies of ten companies impose no restrictions upon occupation; six companies impose restrictions during the first year of the Policy; twenty companies impose restrictions during the first two years of the Policy; one company imposes restrictions during the first three years of the Policy; and five companies make restrictions continuous.

"Military and Naval Service.—The Policies of nine companies contain no restrictions upon Military or Naval Service; six companies impose restrictions during the first two years of the Policy; twenty-seven companies impose restrictions during the continuance of the Policy. Among the latter class there is considerable diversity in the treatment of this risk. The terms actually accorded to policyholders in the Military and Naval Service of the United States during the present war, while showing equally great diversity, have usually been more liberal than those provided under the companies' contracts.

"Intoxicants and Narcotics.—The Policies of seven companies become void, or may be cancelled during a limited period, in case of the excessive use of intoxicants or narcotics. In some cases the reserve, or the premiums paid, are returned. Seven companies

require the applicant to warrant that he is temperate. The Policies of twenty-eight companies contain no restrictions on these points, although the applicant's habits are inquired into.

"The changes in the Policy contract, designed to assist the policyholder directly in keeping it in force are: (1) grace in the payment of premiums; (2) the privilege of re-instatement; (3) loans on the Policy; (4) automatic non-forfeiture conditions. The usage of the companies upon these points is as follows:

"DAYS OF GRACE.—The Policies of sixteen companies provide that a grace of thirty days, or of one calendar month, shall be allowed in the payment of premiums; the Policies of twenty-six companies make no concessions on this point.

"PRIVILEGE OF RE-INSTATEMENT.—The Policies of fifteen companies make provision for re-instatement within periods ranging from thirty days to twelve months; the Policies of twenty-seven companies contain no assurance on this point.

"LOANS.—The Policies of seven companies make provision for loans after being in force two years, those of sixteen after three years, those of five after five years; the Policies of fourteen companies make no provision for loans.

"NON-FORFEITURE CONDITIONS.—The non-forfeiture conditions of thirty-one companies are automatic in their operation, so that an insurance value once acquired under a Policy cannot be lost; the policyholder receives it in some form whether he makes request for it or not. The Policies of eleven companies require some action by the Insured within a limited time in order to receive the benefits of the Non-forfeiture Clause; the Policies of twenty-seven companies allow a choice between Extended and Ordinary Paid-up Insurance; the Policies of fifteen companies make provision for but one form of paid-up value. Of the twenty-six companies which allow Extended Insurance, eighteen deduct the premiums falling due under the original contract in case of death within a limited period; eight companies make no deduction.

"INCONTESTABILITY.—The Policies of thirty-six companies contain clauses making them incontestable under certain conditions; the Policies of six companies contain no such clauses. Of the thirty-six, fifteen make their Policies incontestable after a certain period upon the single condition that premiums or notes given therefor, with interest, be paid as agreed. Of the fifteen, one makes its Policies incontestable upon delivery, three after one year, eleven after two years. The Incontestable Clauses of the remaining twenty-one companies all contain some further condition which is binding during the life of the Policy; but, subject thereto, the clause is made operative by one company from date of issue, by seven companies after one year, by eleven companies after two years, and by two companies after three years.

"SUICIDE.—The Policies of seven companies contain no Suicide Clause; the Policies of eight companies do not assume the risk of death from self-destruction during the first year; those of twenty-one

companies do not assume it during the first two years; those of four companies do not assume it during the first three years; and the Policies of two companies never assume it unless it is proved to be involuntary or the result of insanity."

Mr. McCall proceeds to discuss the "expense rate" and its connection with the "Rebate evil and its twin Lapse," the former, consisting as it does of an allowance to intending policyholders of a discount on their premiums in order to entice them away from other companies, he holds to be "a direct offshoot of improper relations between the agent and his Home Office." This evil has been the subject of repeated discussions by the influential Society known as that of "The Life Underwriters of the United States," and by other similar bodies of Insurance Officials, as well as of legislation in different States, with the object of checking the operation of the system. So far, however, the efforts of these bodies have met with only partial success, this evil showing but little sign of being completely stamped out.

Speaking of the progress made during the last half century by American Life Offices, Mr. B. J. Miller, in the course of a recent Presidential Address delivered before the Actuarial Society of America, says:—"Only forty years ago there were but few American Life Insurance Companies. These were young and small, and issued only Ordinary Life and Term Policies in one sum payable at death, and the modern principles of Non-forfeiture and the Equitable Distribution of Surplus were unrecognized. In the 'sixties' Limited Premiums, Life Policies, and Endowments came into vogue, and Non-forfeiture in the guise of Paid-up and Extended Insurance commenced to be provided for. The Annual Distribution of Surplus on scientific principles was also adopted, and Tontine or Deferred Dividend Plans were announced by some companies. . . . . The 'seventies' were marked with no special innovation, except the growth of the recognition of Non-forfeiture principles in the form of guaranteed Paid-up and Extended Insurance Values. In the 'eighties' a great innovation was made. The 'Semi' or 'Limited' Tontine Plan was adopted by many companies, and guaranteed 'Cash' or 'Loan' Values were provided for. Policies were also made indisputable after two or three years. In the 'nineties' still greater and more important novelties have been adopted, such as the retention of the proceeds of an Endowment Policy during the life of the Insured, or of a Life Policy during a term of years, the company binding itself to pay interest in the meantime; or the payment of a Policy in a given number of instalments, the amount paid being increased on a basis which, in effect, requires a company to act as a Savings Bank, and to guarantee a given rate of interest."*

No description of the practice of Life Assurance in the United States would be complete without some reference to the rise and present position of "Assessmentism," which appears to have obtained

* *Transactions of the Actuarial Society of America*, Vol. iii.

such a firm hold upon the people of that vast country. This is all the more strange since the principle of Assessmentism is the direct opposite to that of the Tontine System, so inseparable from the business of the ordinary American Life Offices. "An Assessment Life Insurance Association," observes the late Mr. Sheppard Homans, "is usually composed of any number of persons who agree, in signing applications for membership, to respond to Assessments in order to provide for the payment of claims by reason of deaths among themselves. That is to say, the payment of death claims in such associations is usually made contingent upon the proceeds of Assessments to be levied upon, and to be collected from, survivors."

The origin of "Assessmentism" in the form adopted by Life Offices in America, may be found in the practice of a Mutual Society in Hanover, established some sixty years ago. That Office charged a very moderate rate for young lives when they entered. Contributions in subsequent years were levied in proportion to the claims that had become due in each year, and according to the then ages of the members; consequently each member had, as he grew older, to pay a higher premium. To obviate the effect of these high levies at advanced ages, a Reserve Fund was instituted, which enabled a uniform rate of contribution to be levied after the age of 75 had been attained.*

There are no means of ascertaining the exact date when Assessment Societies were first started in the United States, but it is probable that the system arose in that Continent about 25 years ago. The modification of this system, known as "The Harper Plan," which gave a fresh impetus to Assessment Societies, appears to have been put into practice about the beginning of the year 1881. To again quote Mr. McCall, "there have been four plans of Assessment Insurance, all of which are still in use, but which may be stated in the order of their development and of their approach to the Level Premium plan, as follows: (1) To assess all members alike, for current cost only; (2) to assess, for current cost only, according to a Table graduated for age at entrance; (3) to assess according to a Table graduated for age at entrance, and lay aside an arbitrary sum or proportion of Assessments for a Reserve Fund; (4) to charge a Level Premium, calculated upon assumptions which give rates approximating those of Level Premium Companies, lay aside a Reserve Fund on the same assumptions, and reserve the right to assess for any deficiency."

Whatever the particular plan may be, however, it is invariably subject to an Assessment which may be made at any future time for an amount, the maximum of which is based on the Rates of Mortality at the then ages of the Assured, according to the American Experience Table, together with a heavy percentage for contingencies. Hence, although the "Assessment" plan has the appearance of

* See remarks by Mr. M. N. Adler, in the discussion on Mr. Manly's Paper already referred to. (*J. I. A.* xxvi., p. 215.)

cheapness, the initial rates being very little more than half those charged by Level Premium Companies, and being also usually paid in bi-monthly instalments, there is still hanging over the policyholder, like the sword of Damocles, the liability to pay, when he begins to grow old, a far heavier amount than would be the case if he had originally effected an assurance with an ordinary company. Nor can he escape from this liability by discontinuing his Policy, since by the terms of his contract he may be compelled to contribute the levies charged to him during the whole of his life.

Besides purely American Life Offices, there are a large number of British and Canadian Companies transacting business in the United States. These companies have, of course, been first required to pay certain taxes and to place themselves under Government supervision in exactly the same way as the native companies. On the other hand, three ordinary companies and one assessment company from the United States have during the past thirty years established branches in various parts of this country, where they prove formidable rivals to our own Offices. All these companies, after making a deposit of £20,000 with the Government, have regularly complied with the requirements of the Life Assurance Companies Act, by making annual and periodical Valuation Returns. They have also separate funds, trustees, and boards of management, especially for British business, and issue prospectuses very much of the same character as those of British Companies, although, as in their own country, the investment element of Life Assurance is a far more prominent feature than the provision of a competency to a wife and family in the event of premature death. Whether their advent to this country and the increased expenditure which it has engendered in Life Offices generally, have proved on the whole to be advantageous to the principles of Life Assurance, is a question which for various reasons we cannot discuss in these pages. Its pro.'s and con.'s have been repeatedly dealt with in the columns of the Insurance Press, to which we must be content to refer our readers.*

Life Assurance in the principal Colonies and Dependencies of the British Empire has proceeded on lines differing in some measure according to the geographical position of the countries in which it has flourished. In the Dominion of Canada, for example, we find the influence of its neighbour, the United States, very predominant, and hence Government supervision, the Tontine, Non-forfeiture and Assessment Systems, and the Contribution Method of Bonus Distribution, are among the principal features of Canadian Life Assurance. In Australasia, South Africa, and the West Indies, however, Life Offices appear to be very similar in character to those in this country. The Legislatures of the various Australasian Colonies, as well as that of the Cape, have nearly all passed Acts for the regulation of Life Assurance Companies, resembling very closely the provisions of the Act of 1870. With one exception, however, these Colonies are as

* This subject has been fully discussed in a little brochure, reprinted from *The Investors' Review*, by Mr. A. J. Wilson. (Longmans, 1893.)

free from State interference as in this country. This exception is the Colony of New Zealand, the Government of which has, for over thirty years, possessed an Insurance Department of its own, which, owing partly to the fact that it is a monopoly and partly to the efficient manner in which the business is carried on by the managing officials, has been of very great benefit to the inhabitants of that Colony. In the West Indies the practice of Life Assurance is chiefly confined to a single Office, having its headquarters on the Island of Barbadoes. This Office, however, which has now been established sixty years, has had a most successful and prosperous career, the result of sound and careful management. It has done much to encourage thrift among the native population, which form more than nine-tenths of its members. In British India, Life Assurance has not made very substantial progress, owing mainly to native prejudices. On this point, Sir Richard Temple, in his work, *India in 1880*, observes:—"It has sometimes been strongly recommended that the Government in India should undertake Life Insurance to a moderate and limited extent. The measure was designed for the benefit of the natives, as being calculated to teach them habits of thrifty forethought, and to form ties of the happiest kind between them and the State. Owing to various practical difficulties, and also to objections against interference with private enterprise in this respect, the Government has not yet seen its way to undertaking business of this nature, however desirable that may be on many grounds." It is only within the last quarter of a century that the principles of Life Assurance have made any headway in India. In 1874, the late Mr. D. McLauchlan Slater* established the *Oriental* Life Office at Bombay, and in spite of much opposition on behalf of the Native Press, carried on a large business with great success. He adopted the policy of charging precisely the same rates of premium to lives belonging to every race in India, whether European, Parsee, Hindoo, Mohammedan, Cingalese, Burmese, or Chinese, and, during the later years of his management, of making no extra charge for opium eaters, the experience of the Office being that this last class of lives was on the whole no worse than those not addicted to the habit.†

There are some features in Colonial Life Assurance which are quite independent of geographical position. Among these may be mentioned (1) the greater energy displayed by Offices in the Colonies compared with those in Great Britain; (2) the larger proportion of lapses in Colonial as compared with British Offices; and (3) the higher rate of interest yielded by the funds of the former over those of the latter. The first of these features is only what might be expected in countries where the inhabitants have long been accustomed to fight their own way in the world and to rely solely upon their own personal exertions. It may be added, however, that this increased

* The sudden death in 1899 of this gentleman, who may be regarded as the pioneer of Life Assurance in India, is an irreparable loss to the cause with which for thirty years he had identified himself.

† Mr. Slater's evidence on this subject, given before the Opium Commission in 1893, is of great interest.

energy is invariably combined with a higher rate of expenditure, since the difficulties of obtaining new business in the scattered districts in the Colonies are simply enormous. As an illustration of these difficulties, we may quote the following descriptions of the method adopted in canvassing by Life Offices in Australia, given by a well-known manager in New South Wales:—"When a trip of this nature is proposed," he remarks, "the agent secures his buggy and horses, which he pays for himself, and also a black boy to ride the spare horses, for, as he may be going to drive for several days right across the Continent, he has to take along about thirty horses. He notifies the company of his intentions, and they send a doctor with him, whose expenses they pay, but the agent is not allowed a cent for expenses. The agent starts off, driving four horses in his buggy, and they go out into the country to get applications. A man is seen ploughing in the field; the agent goes to him, talks to him, and perhaps gets his application. The doctor is at hand, and makes an examination. The agent takes the premium, issues a binding receipt for it, and then they drive to the next person in sight; and so they keep on to the end of the trip, covering the country from station to station, and driving often over 100 miles a day."

The high rate of lapse in the Colonies is due probably to a combination of circumstances. One potent reason is the migratory habits of the population as well as the great distances between the various centres. Another reason is the laxity due to the facility with which loans are granted and also in a measure to the Non-forfeiture System, which is universal throughout the Colonies. It is only fair to state, however, that in times of severe depression, such as those caused by the Financial Crisis in Australia in 1894, the application of the Non-forfeiture System has been the means of saving many thousands of Policies which would otherwise have been lost. A third reason lies in the circumstance that agents in the Colonies generally receive a commuted commission on the first year's premium, so that they are no longer pecuniarily interested in seeing that the renewals are kept up.

The third feature common to Life Offices in the Colonies, viz.:—the high rate of interest yielded by the funds, is due to the greater advantages enjoyed by Offices in investing their surplus capital. The favourite mode of making such investments is undoubtedly by way of mortgage of landed property. This is more the case in Australasia and South Africa, in which Colonies Stock Exchange Securities are but little known, than in the Dominion of Canada, where the assets of Life Offices correspond in their character very closely to those of British Offices. In all our Colonial possessions, with the apparent exception of South Africa, we find a declining rate of interest, but on the whole, such rate may be taken as fully one per cent. higher than that earned on Life Assurance funds in this country.

As in the case of the United States, so in our Canadian, Australian, South African, and West Indian Colonies, British Life Offices have for many years competed with the Native Offices for

business, while within recent years both Canada and Australia have been represented in this country by their leading Offices. These Offices—one from Ontario, one from New South Wales, and two from Victoria—have, like their American *confrères*, received a cordial welcome over here, and, also like them, show no signs of regret at the step they have thus taken.*

* For further information on the subject, the Editor may refer to a Paper on "Life Assurance in Greater Britain," which he read before the Institute of Actuaries in February, 1899.

CHAPTER XXI.

THE WORK OF THE ACTUARY.

The nature of the duties and the position of the Actuary in connection with Life Assurance business appear to be so much misunderstood and to be shrouded with so much mystery that a chapter on the subject will, we hope, prove a serviceable addition to this Handbook.

That the duties of an Actuary in former times were very different from what they are now may be gathered from the following note on the word, extracted from Dr. Murray's New English Dictionary:—

"ACTUARY: (ad. L. *actuāri-us*, an amanuensis, a keeper of accounts, f. *actus*, act).

"1. A registrar or clerk, a notary; an officer appointed to write down the acts or proceedings of a court. Still used in the Convocation of the Province of Canterbury. 1553 FOX, *A. & M.* in Cobbett's *State Trials*, I., 628: 'Requiring also the copies as well of the articles as of his protestation, of the Actuaries.' 1658 BRAMHALL, *Consecr. Bishops*, III., 30: 'The same publick Notary who was principall Actuary both at Cardinall Poles Consecration and Arch-Bishop Parkers.' 1667 CHAMBERLAYNE, *State of Great Britain*, I., II., viii. (1743), 73: 'To this Court [of Arches] belongeth an Actuary, a Register, and a Beadle. The office of the Actuary is to attend the Court, set down the judge's decrees.' 1717 BLOUNT, *Law Dict.*: '*Actuary* (*Actuarius*) is the Scribe that registers the Acts and Constitutions of the Convocation.' 1879 *Whitaker's Alman.* 155, *Conv. of Prov. of Cant.*: '(Officers) Vicar-General, Registrar, Actuary.'

"2. The managing Secretary or Accountant of a public Company. *Obs.* 1804 W. TAYLOR in *Ann. Rev.*, II., 238: 'The Managers and Actuaries of our public Companies.'

"3. An Official in an Insurance Office, whose duty it is to compile statistical tables of Mortality, and estimate therefrom the necessary rates of premium, etc.; or one whose profession it is to solve, for Insurance Companies or the public, all monetary questions that involve a consideration of the separate or combined effect of Interest and Probability, in connection with the duration of human life, the average proportion of losses due to fire or other accidents, etc.

1849 MACAULAY, *Hist. Eng.*, I., 283: 'An Actuary of eminent skill subjected the ancient parochial registers of baptisms, marriages and burials, to all the tests which the modern improvements in statistical science enabled him to apply.' 1859 *Q. Rev.*, No. 211, 75: 'Many Actuaries acknowledge the soundness of that basis for life assurance and annuity calculations.'"

Of these three definitions of the word it will be seen that the first and third only survive at the present day, while the second has long become obsolete. The first, however, consisting as it does of a

single individual, may also be dismissed from our enquiry. This leaves us the third definition only, which may be said to fairly cover the duties of the profession as it now exists.

Although the scope of the profession has never been regulated by statute, the title has nevertheless appeared in several Acts of Parliament during the present century. The earliest mention of an "Actuary" on the Statute Book is contained in "The Friendly Societies Act, 1819," where he is regarded as a person "skilled in calculation." The latest reference to the profession in an Act of Parliament is contained in Sections 16 and 28 (3) of the Friendly Societies Act, 1896, the former of which makes it a condition of registration that the Annuity Tables of a Friendly Society should be "certified by some Actuary approved by the Treasury, who has exercised the profession of Actuary for at least five years."

While, however, the duties and positions of an Actuary have never received definite recognition by Parliament, they have been so fully described by leading members of the profession, as to leave no doubt as to their real scope. It will be sufficient to quote the opinions of three gentlemen, each of whom has filled the position of President of the Institute of Actuaries, such opinions having been given *ex cathedrâ*. These gentlemen are Mr. A. H. Bailey, Dr. T. B. Sprague, and Mr. T. E. Young.

Mr. Bailey considers that "an Actuary should be a man of general culture, with a knowledge both of books and men, and the more he has of both the better. He comes in contact with various classes of the community, and will be of little use unless he can understand and sympathize with the different objects for which he is consulted, and can adapt himself to the different habits of thought of his clients. . . . . Again, the work of the Actuary brings him into constant intercourse with the members of the legal and medical professions. Without some smattering of law he will be stranded altogether; and, although this knowledge may be slight, it is very desirable that it should be sound and accurate as far as it goes. The intercourse of the Actuary with the physician is of a character to call for a passing remark. The latter studies the individual case, the former deals with averages; the physician, therefore, is disposed to attach to what in Life Assurance is called the effect of selection, an importance which the Actuary, from his different studies, should know is not warranted by reason or experience." *

Speaking of the status of the Actuary, Dr. Sprague observes "that he is the financial adviser of those who are responsible for the management of such Institutions as Life Insurance Companies, Reversionary Interest Societies, Friendly Societies, Annuity Societies, Widows' Funds, Superannuation Funds, in fact, all institutions which have to do with monetary transactions dependent upon human life. As the adviser of a Life Insurance Company, the Actuary has most important duties to discharge. When a

* *J. I. A.* xxiii., p. 159.

Life Office is started, one of the first things to be done is, of course, to prepare sets of Tables. . . . . In the course of time, however, when an Office has been in actual operation for some years, quotations will be wanted of premiums for various special risks; and it is the Actuary's duty to calculate these premiums. In order to do this satisfactorily in all the various cases that arise, both practical experience and a thorough knowledge of the theory of the subject are essential. . . . . In calculating premiums, the Actuary must not be guided simply by the rules laid down in the books. He must keep his eyes wide open to what is passing around him, compare carefully the results of theory with the daily practice of his own and of competing Offices, and mentally register for future use the various practical hints thus obtained. If this is done systematically, his advice will have a value that no mere study of the theory of Life Contingencies will give it. In a word, he must think for himself." Dr. Sprague then goes on to speak of his various duties in connection with Life Interests and Reversions, Valuations and Distribution of Profit, and with the different Societies and Funds above-mentioned. *

Mr. Young refers to the education and training of an Actuary in the following terms:—"We seek to produce, not merely technical experts, but men of judgment: not simply adepts in the conduct of processes, but wise masters of the processes they employ. And though undoubtedly the quality of judgment must be native, developable by actual experience, still the resources and skill of a professional educator are competent of service in aiding natural endowment by means of the character of his teaching and his examination tests."† In the course of another Address, Mr. Young urges that "the student of our profession must now, more sedulously than ever, mix with men in business enterprise, and learn from mastered experience in the world itself, the modes of dealing with financial subjects, and the methods and meaning of financial work. *Seclusion* in the study implies *exclusion* from the bracing rivalries and the highest usefulness of professional life; a strict devotion to the region of pure mathematics paralyzes the tact and practical skill which are essential to the estimation of probable evidence; and in obedience to the great Law of Distribution of Force, the specialized cultivation of the mind, without the concurrent development of feeling and of interest in humanity, produces but a fragmentary and unfinished man."‡

The above opinions have been uttered, as already remarked, by former Presidents of the Institute of Actuaries. This body, which has done so much to train, and elevate the status of the Actuary, deserves a brief description of its origin and work. "The first step towards the foundation of the Institute," says Dr. Sprague, "appears to have been taken at the suggestion of the well-known Actuary and

* *J. I. A.* xxiv., p. 229.
† *J. I. A.* xxxiii., p. 476.
‡ *J. I. A.* xxxiii., p. 128.

manager, Mr. William Thomas Thomson. On 15th April, 1848, a meeting of 28 gentlemen, who were Actuaries or Secretaries of Life Insurance Companies, was held at the office of the *Standard* in London. At this meeting Mr. Thomson explained the constitution of the Managers' Association, founded in Edinburgh some fifteen years previously, and the advantages which had resulted from it. The meeting resolved 'That it appears desirable that those connected with the management of Life Insurance Institutions should have occasional opportunity of meeting together and consulting on subjects of mutual interest'; and a committee of ten was appointed to consider as to the best mode of carrying out the above, and to report."* At a later meeting, in the same year, when the formation of the Institute was finally decided upon, the objects of its establishment were specified as :—

The development and improvement of the mathematical theories upon which the practice of Life Assurance is based, and the collection and arrangement of data connected with the subjects of duration of life, health, and finance.

The improvement and diffusion of knowledge, and the establishment of correct principles relating to subjects involving monetary considerations and the doctrine of probability.

A nearer approximation to uniformity of practice, official and professional.

The settlement of points of professional and official usage, and protection generally to the members of the profession and the public.

The elevation of the attainments and status of the members of the profession.

The above objects have, we venture to assert, during the fifty-two years of the Institute's existence, been fully attained, as will be seen by a short summary of the work which it has during this period been able to accomplish.

First and foremost in the useful work of the Institute is its *Journal*, of which 35 volumes have up to the present time been issued. Started originally in 1850, by the public spirit of Mr. Jellicoe and Mr. Samuel Brown, under the title of the *Assurance Magazine*, it has continued for half-a-century without interruption. In 1852 it was officially adopted as the organ of the Institute, and along with its original title called the *Journal of the Institute of Actuaries*. To obtain an idea of the wide scope of its contents it is only necessary to glance through the indexes that have been published of 30 of its volumes, when we find discussed in its pages every conceivable subject which can in any way affect the theory and practice of Life Assurance. As Dr. Sprague, for a considerable period its editor, aptly remarks, it is the leading source of information in this and other countries on matters relating to the profession of an Actuary. It has shown in a most effectual way that the spirit of the founders of the Institute has ever been preserved in its integrity.

* *J. I. A.* xxiv., p. 2.

Another prominent feature of the Institute's work is that of the examinations by which every year it tests the qualification of its different classes of members until they are finally admitted into the full membership by receiving a certificate of their competency to practice as an Actuary. It may be here mentioned that the membership of the Institute is composed of three grades—Fellows, Associates, and Students, while recently there has been formed a class of non-members, called Probationers. On rare occasions Fellows and Associates are elected by ballot without undergoing the necessary examinations, but the most usual process of becoming either a Fellow or Associate is to pass the examinations prescribed by the bye-laws of the Institute. These, which are held simultaneously in London, Edinburgh, and the principal centres of the Colonies, consist of three parts, the third and final part for the class of Fellows being divided into two sections, both of which must be passed in order to obtain admission into this class. By this means the Institute ensures that its Fellows are possessed of considerably more than a rudimentary knowledge of the principal subjects with which an Actuary should be acquainted.

Of no less importance than either of the above is the collection on two separate occasions of the Mortality Experience of British Life Offices. The results of the first Experience have been published in the form of Monetary Tables at various times during the last thirty years, while those of the second Experience are as yet uncompleted. The Tables based on the earlier Experience have long occupied the highest position as Standard Tables, representing the values of Assurances, Annuities, and Premiums at various rates of interest, derived from the mortality of assured lives.

Lastly, may be mentioned the publication, under the superintendence of the Institute, of a Text-Book, divided into two parts—one dealing with problems involving interest only, and the other with those involving the element of mortality, either alone or combined with that of interest. This Text-Book is claimed by the Institute to constitute a complete treatise illustrating the various mathematical principles upon which is founded the theory of Actuarial Science. So highly is the Text-Book regarded on the Continent that, in 1895, a leading Belgian Actuary published a translation of Part II. in the French language.

Although the Institute of Actuaries was established so long ago as 1848, it was not until the year 1884 that, by the grant of a Royal Charter, its work received complete recognition by the Government. This delay was caused mainly by the opposition of a body of Actuaries, also established in the year 1848 under the title of the Actuaries' Club, not in sympathy with the more democratic spirit of the Institute. An understanding between the two bodies was, however, at last arrived at, the result being an amalgamation between them by the Members of the Club becoming Fellows of the Institute. Under an entirely different form the Actuaries' Club still exists in complete harmony with its former rival. It may be added that a

partial recognition of the representative character of the Institute was on at least three occasions accorded by departments of the Government prior to the grant of a Charter, while in 1894 it was to a great extent instrumental in modifying the provisions of Sir William Harcourt's celebrated Finance Bill.

In its earlier years the Institute had to contend not merely with the opposition of the Actuaries' Club, but also with dissensions in its own ranks. In 1855, owing to differences of opinion between the English and Scotch members as to the principle upon which the office-bearers of the Institute should be elected, almost all the Scotch members, forming more than one-third of the whole body of the Institute, resigned "upon the ground," Dr. Sprague tells us, "that, after an existence of seven years, the Institute had not attained the position, or successfully promoted the objects, which it was intended to secure; that it had not in any satisfactory way advanced the science of Life Assurance; and, as a machinery of friendly communication among all persons in England and Scotland and abroad who are interested in the subject, had proved of comparatively little value."

As a proof of the advance of the Institute in popularity since the grant of a Royal Charter in 1884, it may be mentioned that, while on 31st March in that year the total number of its members was 385, consisting of 4 Honorary Members, 135 Fellows, 237 Associates, and 9 Corresponding Members, on 31st March, 1899, the membership, in addition to a number of Probationers, consisted of a total of 834, viz., 1 Honorary Member, 195 Fellows, 248 Associates, 373 Students, and 17 Corresponding Members. The following is a complete list of gentlemen who have held the position of President of the Institute since its establishment:—

1848.	John Finlaison.	1886.	Archibald Day.
1860.	Charles Jellicoe.	1888.	Wm. Sutton.
1867.	Samuel Brown.	1890.	Benjamin Newbatt.
1870.	W. B. Hodge.	1892.	Augustus Hendriks.
1872.	Robt. Tucker.	1894.	A. J. Finlaison, C.B.
1875.	J. Hill Williams.	1896.	T. E. Young.
1878.	A. H. Bailey.	1898.	H. W. Manly.
1882.	T. B. Sprague.	1900.	C. D. Higham.

Allusion has been made to the secession of nearly the whole of the Scotch Members of the Institute in 1855. In the following year these Members formed a body, similar in character to the Institute, to which was given the title of the "Faculty of Actuaries in Scotland." The objects of this new body were stated to be "for the purpose of associating professionally those gentlemen who are engaged in the management of Life Assurance Institutions, or who are otherwise following the profession of an Actuary: for promoting the study of the doctrine of probabilities; of vital statistics and statistics in general; of finance, as bearing on fluctuations in the value of money; and of all cognate subjects, a knowledge of which is essential to the efficient discharge of the duties of a Life Assurance Manager and Actuary."

On its establishment the Faculty consisted of Fellows, Honorary

Fellows, Non-resident Members, and Associates. It now consists of Fellows, Honorary Fellows, and Associates, together with a class of non-members called Students. The Faculty, which in 1868 was incorporated by Royal Charter, has since its establishment done much useful work in Scotland by means of educating the younger members of the profession, and of carrying out the objects stated in its constitution. In 1872 it published the results of an investigation made into the Mortality Experience of the ten Scottish Offices which formed part of the whole Experience collected by the Institute; while in the second of these investigations which the Institute has undertaken the Faculty has worked jointly with the Institute. It may be added that, under a recent rule of the Institute, all Fellows of the Faculty are eligible to be proposed for election by ballot as Associates of the Institute without being required to pass the examination for this class.

A material distinction between the practice of the Institute and the Faculty lies in the circumstance that, while in the former body there are Sessional Meetings at which Papers on subjects relating to the Theory and Practice of Actuarial Science are read by the members, this has never been part of the plan of the Faculty, it being believed that such a procedure would result in the senior members taking part in the discussion to the exclusion of the junior members. Accordingly in January, 1859, under the auspices of the Faculty, another body was formed, called the "Actuarial Society of Edinburgh," which consisted of the junior members of the Faculty only. In this body there are periodical meetings during the Session at which the members contribute Papers of interest generally to the profession, followed by a discussion. These Papers, together with the discussions that follow, are subsequently published in the *Journal* of the Society—a work which is highly appreciated by Students not only in Scotland but in England.*

In 1881 the Actuarial Society of Edinburgh was followed by the formation of a similar Society at Glasgow, the objects of which, however, were of a wider scope than those of the older Society. They were (1) the promotion of the study of the principles of Fire and Life Assurance, and of Assurance against other contingencies; (2) the consideration of all subject to which the doctrine of probabilities may be applied, as well as the best method of collecting and applying statistics; (3) the consideration of questions bearing on social science or political economy; (4) the formation of a library of Professional Works for the use of the members.

The success of this last-mentioned Society led to the gradual formation, on similar lines, of Insurance Institutes in the principal towns of England, as well as in Dublin. In March, 1897, all these different Institutes became federated for certain purposes, each Institute sending two representatives to the Federation of Insurance Institutes. One interesting feature connected with these provincial

* The history and work of this Society have been ably described by Mr. G. M. Low, in a Paper published in its *Transactions*. (Vol. i., No. 10.)

Institutes is that they send invitations to leading Actuaries and other Insurance experts to attend their meetings and give instructive Addresses.

Nor has the formation of Insurance Institutes of this character been restricted to our own country, since the example set by Glasgow has been followed by four of our Australasian Colonies—Victoria, New South Wales, South Australia, and New Zealand—as well as by South Africa. In April, 1889, was founded the Actuarial Society of America, which assembles for the purpose of discussion and social intercourse twice a year in the principal cities of the United States and Canada.

In the performance of his various duties, which frequently involve long and intricate calculations, the Actuary has received no inconsiderable assistance by the use of mechanical aids to calculation. Calculating machines of various forms have been in use for over 250 years, the earliest of which we have any record being that invented by Pascal about the year 1641. This was followed by the inventions of L'Epine, Leibnitz, Polenus of Padua, Hahn of Würtemburg, and Müller of Hesse-Darmstadt. In 1821 Mr. Charles Babbage, with the financial aid of the Government, commenced the construction of a differential machine, which, however, after twelve years' continuous labour was never completed. Twenty years later Messrs. E. and G. Scheutz, two Swedish engineers, constructed a large machine, based on a study of Babbage's invention, for the evolution of any series subject to a fixed law. It was by means of this machine that Dr. Farr constructed his third English Life Table. In the early part of this century Mr. Thomas de Colmar, formerly manager of the *Soleil* Assurance Office in Paris, invented his famous Arithmometer, which was exhibited at the International Exhibitions of 1851 and 1862. This machine was used by Mr. R. P. Hardy in the calculations necessary for his well-known Valuation Tables, published in 1873. About this time a mechanic named Tate directed his attention to the subject, and, after conducting a long series of experiments, succeeded in producing and patenting the present Arithmometer, containing the best material and workmanship, with fewer working parts, and with improvements in the arrangements, which ensure absence of error while in operation, and which from their strength are able to bear the strain of continuous work for some years without repair.*

The following description of Tate's Arithmometer has been given by Mr. George King: "The Arithmometer is constructed to add and to subtract; and by means of continued addition or subtraction it can perform multiplication and division with great rapidity. The top of the machine consists of two plates, which may be called the 'fixed plate' and the 'slide' respectively. On the fixed plate are slots with moveable 'markers,' each of which can be placed against any number desired, from 0 to 9, these numbers appearing in order along the left of each slot. On the left of the fixed plate is the 'regulator,' by means of which the machine may be set for addition

* This machine is manufactured solely by Messrs. C. & E. Layton.

or subtraction, as may be required; and on the right is the 'motive handle,' which can be turned only in the direction of the hands of a clock, and by means of which the machine is set in motion. In the slide is a row of 'product holes,' and the slide, on being lifted, can be passed from left to right or the contrary, so that the position of the product holes with respect to the slots in the fixed plate may be varied at pleasure. A number is 'placed on' the machine by marking it on the fixed plate by means of the markers in the slots. The number so placed on the machine can be 'thrown up' on the slide, by placing the regulator at addition, and giving one turn to the motive handle. If a second turn be given to the handle, the number is again thrown up, and added to the number already on the slide, and so on; by each turn of the motive handle the number on the fixed plate being thrown up at once, and added to whatever number may already be on the slide. In this way multiplication is performed. The number on the fixed plate will be thrown up in the units place, or the tens place, &c., according to the position of the slide with regard to the fixed plate." Mr. King then proceeds to describe the different processes of using the machine, remarking that "for the purposes of the Actuary its principal advantage lies in its power to multiply two numbers together, and add the product to a third number, without recording the intermediate steps."*

This machine, it may be added, is in constant use in various Government departments, as well as in Insurance Offices, not only in this country but in the United States and the Colonies.

Institute of Actuaries' Text-Book, Part II., p. 383. Other descriptions of the mechanism, improvements, and advantages of Tate's Arithmometer may be found in a Paper read before the Society of Arts, in March, 1886, by Prof. C. V. Boys, F.R.S., and in one read before the Actuarial Society of America in 1892, by Mr. M. H. Peiler, and published in Vol. ii. of the Society's *Transactions*.

CHAPTER XXII.

THE LITERATURE OF LIFE ASSURANCE.

The subject which we now propose to discuss may be conveniently divided into two sections, viz.: Theory and Practice. In the theoretical section of Life Assurance, or, as it is termed, Actuarial Science, are comprised the various treatises that have been written upon the Theory of Probabilities, the construction of Mortality Tables, and the Values of Annuities. The practical section of the subject is chiefly of a periodical character, consisting of criticisms and suggestions which have appeared from time to time in the Insurance Press, as well as in Papers and Essays read before the Institute of Actuaries and other Societies connected with the Insurance World.

Whether, however, we regard the practical or theoretical side of Life Assurance, the subject presents a very wide aspect to our view, and hence becomes difficult to compress into the very limited space at our command. We must, therefore, content ourselves with a brief survey, during different periods, of the literature which in no small degree has been the means of placing the Theory and Practice of Life Assurance in the high and firmly established position which they occupy at the close of the nineteenth century.

Of the Theory of Life Assurance at the beginning of this century, it may be asserted that but little more than the rudimentary elements, and these only imperfectly, was known by those whose duty it was to make the necessary calculations in connection with the business of a Life Office. The highest authorities on the subject at this time were Dr. Price and Mr. William Morgan, to whom the Northampton Table, then in general use, owes so much of its importance. In 1810, Mr. Francis Baily issued his famous treatise on "The Doctrine of Life Annuities and Assurances analytically investigated and explained," while in the following year the first edition of Inwood's Tables was published. In 1815, appeared a work which revealed a deep knowledge of various problems in Actuarial Science. This was the well-known treatise in two volumes of Joshua Milne on the Valuation of Annuities and Assurances, containing the celebrated Carlisle Mortality Table. At a subsequent period Milne wrote for the seventh edition of the *Encyclopædia Britannica* the valuable articles on "Annuities" and "Human Mortality." In 1824 there was published at Edinburgh, under the superintendence of the Highland Society, an elaborate Report on Friendly or Benefit

Societies, exhibiting the Law of Sickness as deduced from returns by Friendly Societies in different parts of Scotland. The following year is noteworthy for the issue of Griffith Davies' "Tables of Life Contingencies," based partly upon the Equitable Experience and partly upon the Northampton Table, and of a letter from Benjamin Gompertz to Francis Baily "On the nature of the function expressive of the Law of Human Mortality." In 1827, chiefly through the exertions of Lord Brougham, was formed "The Society for the Diffusion of Useful Knowledge," for the publication in monthly parts of treatises on various scientific subjects. Of these treatises three were connected with Actuarial Science, viz., that by Sir J. W. Lubbock and Mr. Drinkwater Bethune "On Probability," published in 1830; that by Charles Ansell on "Friendly Societies," published in 1835; and that by David Jones on "The Value of Annuities and Assurances," published in 1840. The last of these works, it need hardly be said, is still considered a necessary part of the Actuary's library. In 1829, Mr. John Finlaison issued his Report on the evidence and elementary facts on which Tables of Life Annuities are founded. In 1838, Professor De Morgan wrote for Lardner's *Cabinet Cyclopædia* his "Essay on Probabilities, and on their application to Life Contingencies and Insurance Offices."

The closing years of the first half of this century gave ample proof that Actuarial Science had made considerable strides since its commencement. The year 1843 saw the issue of the earliest Mortality Table based on a Combined Experience of Assured Lives, viz., the Seventeen Offices' Table. Six years later appeared the first edition of Mr. Peter Gray's "Tables and Formulæ for the Computation of Life Contingencies," which is still a standard work of reference. In 1850 Mr. William Orchard issued his invaluable Conversion Tables, and, under the auspices of Mr. Charles Jellicoe and Mr. Samuel Brown, the first number of the *Assurance Magazine*, afterwards incorporated into the *Journal of the Institute of Actuaries*, appeared. This last-mentioned publication, more than any other work, has now for half-a-century inculcated and developed the principles of Actuarial Science.

The history of this period of the growth of the theory of Life Assurance would be incomplete without some reference to the labours of two distinguished scientific men in different departments of the subject—Professor De Morgan and Dr. Wm. Farr. The former of these gentlemen, who was Professor of Mathematics at University College, London, and Secretary of the Royal Astronomical Society, was a frequent contributor to the *Assurance Magazine* on various questions arising out of Annuities and the Law of Mortality. The latter, who was for many years Superintendent of the Statistical Department of Somerset House, by means of his three English Life Tables and other writings in connection with the subject of Life Contingencies, has left behind him contributions to actuarial literature of the highest value.

In its more modern stages Actuarial Science may be said, as is

suggested above, to have been developed almost entirely in the pages of the *Journal of the Institute of Actuaries*, a reference to which reveals at once the enormous scope and intricate nature of the Science. The contents of this work, which is issued at quarterly intervals, may be divided into four principal classes—Presidential Addresses, Papers read at the Sessional Meetings, Prize Essays on selected actuarial subjects, and contributions not included in the above. Among those whose contributions to the *Journal* are most valued may be mentioned the following:—Charles Jellicoe, Samuel Brown, J. A. Higham, Prof. De Morgan, A. H. Bailey, Archibald Day, T. B. Sprague, W. M. Makeham, W. S. B. Woolhouse, George King, G. F. Hardy, and G. H. Ryan. The most prominent subject discussed in the *Journal* within recent years is, undoubtedly, that of the application of the Law of Mortality to the graduation of different functions.

We will conclude the consideration of the Theory of Life Assurance by enumerating in chronological order a list of works relating to the subject, published within the last forty years, and which are still consulted for purposes of reference in actuarial calculations.

Table of the Reciprocal of Numbers from 1 to 100,000.—Lieut.-Col. W. H. Oakes.
Mortality Experience of Life Assurance Companies, collected by the Institute of Actuaries.*
Life Tables deduced from the above Experience.
Observations on the Rate of Mortality of Assured Lives, as experienced by Ten Assurance Companies in Scotland.—James Meikle.
Valuation Tables based upon the H^M Table at 3, $3\frac{1}{2}$, 4, and $4\frac{1}{2}$ per cent.—R. P. Hardy.
Statistics of Families of the Upper and Professional Classes.—Charles Ansell, Junr.
Rates of Mortality and Sickness according to the Experience of the Ancient Order of Foresters.—F. G. P. Neison.
The Theory of Finance.—George King.
Institute of Actuaries' Text-Book, Part I.—Wm. Sutton.
Tables of Endowment Assurance Policy Values according to H^M Mortality.—D. Carment.
System and Tables of Life Insurance.—L. W. Meech.
Tables of Annuities and Premiums at $3\frac{1}{2}$ per cent.—F. J. C. Taylor.
Tables for finding the Values of Policies of all Durations, according to any Table of Mortality or any Rate of Interest.—J. Chisholm.
Institute of Actuaries' Text-Book, Part II.—George King.
Interest Tables from $\frac{3}{4}$ to 10 per cent.—Lieut.-Col. W. H. Oakes.
Premium Conversion Tables.—H. J. Rothery and G. H. Ryan.
Valuation Tables based on the H^M Table at $2\frac{1}{2}$ per cent. Interest.—G. King and W. J. H. Whittall.
Valuation and other Tables based on the H^M Table at $3\frac{3}{4}$ per cent.—W. A. Bowser.
Friendly Societies' Valuation and other Tables.—W. A. Bowser.
Joint-Life Annuity Tables.—A. J. Finlaison.
Select Life Tables.—T. B. Sprague.
Valuation Tables based on the H^M Table at $2\frac{1}{4}$ and $2\frac{3}{4}$ per cent. Interest.—E. Colquhoun.

* A list of Tables, in course of publication, relating to the Experience 1863-93 will be found at the bottom of page 89

In addition to these works may be mentioned the articles in the ninth edition of the *Encyclopædia Britannica* on "Annuities" and "Life Assurance," the former being by Dr. T. B. Sprague, and the latter from the pen of Mr. G. M. Low.*

The literature of Life Assurance has also been enriched by standard works devoted entirely to its legal aspect. Up to 1854 the treatise of Mr. G. D. B. Beaumont was the leading authority upon this subject. In this year, however, appeared the first edition of the more elaborate work of the late Mr. C. J. Bunyon, which, having reached a third edition in 1891, has now for nearly half a century been considered supreme on all points relating to the Law of Life Assurance.† The author of this standard work was, it may be added, not only a member of the Bar but also one of the leading Actuaries of his time, and the manager of a large Insurance Company.

The influence of the Insurance Press upon the Practice of Life Assurance has been of enormous value, especially during the period when so many fraudulent companies were being established. It was, indeed, a misfortune that, owing to the heavy Newspaper Tax existing in the earlier part of the century, such a beneficial influence could not exist. Whatever criticism was made on the management of Life Assurance Companies at that time was effected by individuals by means of pamphlet writing. Out of the large number of pamphlets of this description may be mentioned two, one being the work of Francis Baily, entitled "An Account of the several Life Assurance Companies in London, containing a review of their respective merits and advantages." This work, which ran through two editions, was published in 1810. The other work, which was from the pen of Charles Babbage, was published in 1826, under the title of "A comparative view of the various Institutions for the Assurance of Lives." This work contains some valuable criticisms on the different Life Offices then in existence, as well as suggestions for their improvement. It was reviewed in an elaborate historical article in the *Quarterly Review* for January, 1827, as well as in the *Edinburgh Review* for March, 1827. It was also translated into German, and obtained an extensive circulation in that language.

It was not till 1840 that the first Insurance Newspaper was published. This was the *Post Magazine*, which received its title in the following circumstances. Owing to the heavy Newspaper Stamp, which was required at that time to be impressed upon every copy of a journal which circulated news, it was impossible to establish an Insurance Newspaper, pure and simple, so there was no alternative but to fall back upon the Penny Post, then just come into operation, and by its means to circulate a sheet which might be a magazine of information and also a letter, but yet not a newspaper. Mr. J. H. Hartnoll, the founder of "this literary trifle," as he modestly describes it in the first number, gives the following account of its origin:—

* Mr. Low has also exhaustively treated this subject in a valuable Paper read before the Third International Congress of Actuaries in June, 1900.

† Published by C. & E. Layton.

"It had previously occurred to me that, by printing literary matter on a sheet within that weight [half an ounce], leaving the first two pages blank for the purpose of being used in private correspondence, or as a trade circular, and a portion of a third page for receiving, when folded, the address of the individual to whom it was forwarded, such a Magazine would pass free under cover of the letter label. The contrivance took with the public amazingly; and thousands of copies found their way weekly into the remotest parts of the United Kingdom by postage distribution. . . . . It was necessary to give the Magazine a class character; and I was enabled to do so by making the discovery, for it really was a discovery, that Life Assurance, although of such deep importance to society at large, had no representation in the Press; that it was a subject little talked about in private circles, and very seldom adverted to in the public journals." *

It was not long before the *Post Magazine* had opportunities of making its influence upon the practice of Life Assurance felt. Upon "The Companies Act, 1844," coming into force, a rush was made to incorporate companies under its provision, this being especially the case with Insurance Companies, a very large number of which came into existence within a few years after the passing of this Act. To these new companies the *Post Magazine* gave a considerable amount of attention, and repeatedly exposed those which were nothing more than swindles. In 1853, the House of Commons appointed a Select Committee on Assurance Associations, and among the witnesses examined was Mr. W. S. D. Pateman, the publisher of the *Post Magazine*. This gentleman, in the course of his evidence, gave an account of the various "Bubble Companies" which had been formed under the Act of 1844, and startled the Committee by showing the facilities by which such companies were able to defraud the public.

The Act of 1870 has happily made the formation of "Bubble Companies" things of the past, but the *Post Magazine* has ever preserved intact the practice of pointing out and condemning instances of mismanagement in Life Offices, which was initiated by its original founder. At the same time it has never failed to keep abreast of the times and to give encouragement to the development of Life Assurance on sound and progressive principles. It may be added that under the auspices of this paper, several useful works relating to the practice of Life Assurance have been issued, among them being the first edition of Walford's *Insurance Guide and Handbook*.

In 1863 the *Insurance Record* was started with the object, as its title suggests, of recording events in the Insurance world rather than of attacking abuses. In carrying out this object, which has principally consisted of giving full reports of the Sessional Meetings of the Institute of Actuaries and of the Annual Meetings of

* A very interesting account of the origin and work of the *Post Magazine* is given in its Jubilee Number of 26th July, 1890.

Insurance Companies, the *Insurance Record* has done great service in promoting the welfare of Life Assurance in all its branches.

Among other newspapers, in which Life Assurance forms a special feature, the *Insurance Agent and Review* (1866), the *Commercial World* (1868), the *Review* (1869), the *Finance Chronicle* (1869), and the *Policy Holder* (1883), may be particularly mentioned, but a complete list of the Insurance Press will be found at the end of *The Insurance Register*.*

Within recent years it has been customary for a considerable number of Financial and Daily Evening Papers to devote some of their space to the discussion of subjects connected with Life Assurance, so that nowadays the general public have no reason to be led astray by interested canvassers through ignorance of the merits and defects of particular schemes or methods. The motto "Freedom and Publicity," which has been applied to the provisions of the Act of 1870, may still be regarded as the watchword of those whose aim is to secure economy in management and stability in position in combination with a steady progress in development. There are, no doubt, among the Insurance Press, as elsewhere, Papers which, existing as they do more upon their advertisements than upon their circulation, are in the habit of levying blackmail upon Life Assurance Companies by means of unfair criticism. We cannot believe, however, that these Papers have much influence upon the general public, who are becoming sufficiently enlightened by the sound portion of the Insurance Press to discriminate between the chaff and the wheat.

We may conclude these remarks with a quotation from a Paper on "The Position of the Insurance Press in relation to Insurance Offices and Insurance Interests," read before the Institute of Actuaries by the original author of this *Guide* nearly twenty years ago.

"I confess to thinking," he observes, "that the highest position the Press could take would be to address the general public, and advocate insurance because it is for the common good. There would then be no appeals to Offices for patronage. The Offices would seek the journals and advertise in them, merely because they deemed it their interest to do so. The journals might remain Insurance journals in the true sense of expounding all that relates to Insurance; but they would no longer assume the *rôle* of being the organs of the Insurance Offices. Perhaps the relations between the Offices and the Press will never be entirely satisfactory until this stage be reached!"

* Published annually by C. & E. Layton

APPENDIX A.

CHRONOLOGICAL LIST OF LIFE OFFICES.

First Period	...	...	...	...	1699	to 1762
Second	,,	...	...	...	...	1762 ,, 1815
Third	,,	...	...	...	...	1815 ,, 1844
Fourth	,,	...	...	...	...	1844 ,, 1862
Fifth	,,	...	...	...	...	1862 ,, 1870
Sixth	,,	...	...	...	...	1870 ,, 1900

CHRONOLOGICAL LIST OF LIFE OFFICES.

FIRST PERIOD.

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1699	Society of Assurances for Widows and Orphans.	About 1711	First Life Office.
1700	Second do.	,,	
1704	New Assurance Co. on the Lives of Men, Women, and Children.	1707	Died out.
1706	Amicable Society	1866	Transferred to Norwich Union.
1707	Proprietors of Traders' Exchange...	1710	
1708	Friendly Society for Money upon Lives.	Unknown	
,,	Office of Assurance of Money upon Lives.	,,	Died out.
1709	Amicable Society	,,	Name afterwards taken by the Society of 1706.
,,	Berkshire and Counties	,,	First Provincial Life Office.
,,	Haberdashers' Hall	,,	First Tontine Society in England.
,,	Monthly Society of Assurance ...	,,	Monthly Dividends for Claims.
,,	Taylor's Friendly Society	,,	Died out.
1710	Life Insurance Bank	,,	,,
,,	Mutual Contribution	1711	Killed by Act of Parliament.
1711	Grand Contribution Office... ...	,,	,,
,,	London Charitable Insurers ...	,,	,,
,,	Mariners' Life Insurance Association.	,,	First of its class in England
,,	Nonsuch and Most Advantageous	,,	Killed by Act of Parliament.
,,	Original Office	1720	Died in South Sea Panic.
1712	Advantageous Office	1712	Killed by Act of Parliament.
,,	Hereditary Company, &c.... ...	,,	,,
,,	Most Advantageous Insurers ...	,,	,,
,,	Most Beneficial	,,	,,
,,	United and Most Beneficial ...	,,	,,
1714	British Society	Unknown	Died out.
,,	London Insurers	1720	Died of Panic.
1715	Perpetual Insurance on Lives ...	,,	,,
1717	Great Britain Royal Society ...	Unknown	Died out.
,,	Most Generous	1718	
1719	York Building Company	1720	*Ultra vires* its Charter.
1720	Hallett's Insurance...	1720	Charter refused.
,,	London Assurance Corporation ...	Existing	
,,	New Assurance Offices	1720	Wrecked in Panic.
,,	Royal Exchange Corporation ...	Existing	
,,	Sailors' Life...	1720	Killed in Panic.
,,	Symond's Insurance	,,	,,

SECOND PERIOD.

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1762	Equitable Society	Existing	Charter refused.
1777	New Laudable Insurance	Unknown	
1778	Knox's Patent Life Assurance ...	,,	Patent granted, but the Scheme died.
,,	Universal Institution	,,	
1779	British Assurance Society (No. 1)..	,,	No legal constitution.
1792	Westminster Society	1863	Transferred to Guardian.
1795	Life Assurance Society for Widows	Unknown	
1797	Minerva (No. 1)	1799	Died out.
,,	Palladium (No. 1)	Unknown	
,,	Pelican	Existing	
1799	Commercial (Irish)...	1826	
,,	Royal Exchange (Irish)	1821	Transferred to National of Ireland.
1800	British Assurance Society (No. 2)..	Unknown	
1803	Globe Insurance Company ...	1864	Amalgamated with Liverpool & London.
1805	Albion (No. 1)	1858	Transferred to Eagle.
1806	London Life	Existing	
,,	Provident	,,	
,,	Rock...	,,	
1807	Eagle	,,	
,,	West of England	1894	Transferred to Commercial Union.
1808	Atlas	Existing	
,,	Hibernian	Unknown	Died out.
,,	Norwich Union	Existing	
1810	Birmingham...	1826	Trans. to Provident.
,,	Sun	Existing	
1813	Union	,,	Originally established as a Fire Office in 1714.
1814	Marine (Irish)	1827	Died out.
1815	Scottish Widows' Fund	Existing	First Scotch Life Office.

THIRD PERIOD.

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1818	Kent	1824	Dissolved by Act of Parliament.
1819	European (No. 1)	1858	Transferred to People's Provident.
1820	British Commercial	1860	Trans. to British Nation.
,,	General Benefit	1854	Ceased to carry on business.
,,	Imperial	Existing	
,,	Mutual Benefit Society	1858	Became enrolled as a Friendly Society.
,,	Star (No. 1)...	Unknown (before 1827)	
1821	Commercial (No. 1)	1846	Transferred to Standard.
,,	Guardian	Existing.	
1822	National (No. 1)	1827	
,,	National Assurance of Ireland ...	Existing	
1823	Bombay (London)	Unknown	
,,	Economic	Existing	
,,	Edinburgh	,,	
,,	Law Life	,,	
,,	North British and Mercantile ...	,,	Originally established as a Fire Office in 1809
,,	Royal (Irish)	1827	
,,	Shamrock (Irish)	1825	
1824	Alliance	Existing	
,,	Asylum	1857	Transferred to London Assurance Corporation.
,,	Berkshire and Gloucester	1829	Transferred to Medical and Clerical.
,,	Herts, Cambridge and County ...	1828	,,
,,	Landlord and Tenant	1825	
,,	Leeds and Yorkshire	1864	Transferred to Liverpool and London.
,,	Manchester	1846	Life Department transferred to Pelican.
,,	Medical & Clerical	Existing	Now Clerical, Medical and General.
,,	Palladium (No. 2)	1856	Transferred to Eagle.
,,	Patriotic	Existing	
,,	Protector (No. 1)	1827	Transferred to Eagle.
,,	St. Patrick's (Dublin)	1829	
,,	Scottish Union	1878	Amalgamated with Scottish National.
,,	South Devon	1827	
,,	Sussex County and General ...	Unknown	
,,	United Empire	1827	Transferred to Eagle.
,,	United Kent	Existing	
,,	Yorkshire	,,	
1825	Aberdeen	,,	Afterwards Scottish Provincial. Transferred to Northern.
,,	Ægis (No. 1)	,,	Afterwards English and Cambrian (No. 2).

THIRD PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1825	Alliance (Irish)	1836	
,,	Caledonian (London)	Unknown (before 1831)	
,,	Crown	1892	Amal. with Law Union.
,,	English and Cambrian (No. 1) ...	1827	
,,	Gloucester (and Worcester) ...	1828	
,,	Standard	Existing	Founded as "Life Insurance Co. of Scotland."
,,	Surrey and Southwark	1826	
,,	University	Existing	
1826	Blyth Phœnix	Unknown	Became registered under Friendly Societies Acts.
,,	Promoter	1862	Transferred to Guardian.
,,	Scottish Amicable	Existing	
,,	Sheffield	Unknown	
,,	West of Scotland	1837	Afterwards Melettus.
1829	Clergy Mutual	Existing	
1830	National (No. 2)	1895	Amalgam. with Mutual.
1831	Aberdeen Mutual	1886	
,,	Scottish Equitable	Existing	
1832	Friends' Provident	,,	
,,	United Assurance Society... ...	,,	Became registered under Friendly Societies Acts.
1833	Argus	1888	Transferred to Imperial.
,,	Caledonian	Existing	Founded as a Fire Office in 1805.
1834	Leicestershire	1840	Transferred to Clerical and Medical.
,,	Mutual	1895	Amalgam. with National
,,	United Kingdom	1862	Trans. to North British.
,,	Universal	Existing	
,,	York and North of England ...	1844	Afterwards York and London. Transferred to Standard.
1835	Farming Endowment	1861	Transferred to Albert.
,,	Metropolitan	Existing	
,,	Monarch	1857	Transferred to Liverpool and London.
,,	National Provident...	Existing	
,,	New Mutual	...	Never completely estab.
,,	Nottingham and Derby	1869	Trans. to Norwich Union
,,	Protector (No. 2)	1847	Transferred to Eagle.
1836	Hand-in-Hand	Existing	Originally established as a Fire Office under the title of "Amicable Contribution" in 1696.
,,	Legal and General	,,	
,,	Licensed Victuallers	1857	Afterwards Monarch (No. 2). Trans. to Liverpool & London.
,,	Liverpool and London	Existing	Became Liverpool and London and Globe in 1864.

THIRD PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1836	London Union	1839	
,,	Mentor (No. 1)	...	Never completely estab.
,,	Minerva (No. 2)	1864	Transferred to Standard.
,,	North of Scotland	Existing	Afterwards Northern.
,,	Westminster and General	,,	
1837	Britannia (No. 1)	1865	Transferred to Briton.
,,	Dissenters and General	Existing	Now General.
,,	Dublin Widows' Fund	1881	
,,	Inverkeithing	Unknown	Became registered under Friendly Societies Acts.
,,	International	1868	Transferred to Hercules.
,,	Mutual Accumulation	1847	Trans. to City of Glasgow.
,,	National Loan Fund	1855	Afterwards International (No. 2.)
,,	Royal Naval and Military... ...	1866	Transferred to European.
,,	Scottish Provident	Existing	
1838	Albert	1869	Wound up in Chancery.
,,	British and Colonial	1842	
,,	City of Glasgow	Existing	
,,	Edinburgh and Glasgow	,,	Afterwards Life Association of Scotland.
,,	Freemasons and General	1850	Transferred to Albert.
,,	United Mercantile and Travellers	1841	Transferred to National Mercantile.
,,	Victoria	1865	Transferred to Standard.
1839	Active	1841	
,,	Alfred	1849	Transferred to Eagle.
,,	Ark (No. 1)...	Unknown	
,,	Australian Colonial and General ...	1852	Transferred to Liverpool and London.
,,	Britannia Mutual...	1865	Transferred to Briton.
,,	British Empire (No. 1)	1845	Transferred to Licensed Victuallers.
,,	English and Scottish Law... ...	Existing	
,,	General Life and Invalid	Unknown	
,,	London, Edinburgh and Dublin ...	1846	Transferred to Liverpool and London.
,,	London Equitable (No. 1) ...	1840	
,,	London and Westminster	1844	Transferred to Britannia Mutual.
,,	Stamp and Tax Office Assurance Co.	1848	Wound up.
,,	Standard of England	1865	Afterwards Britannia Mutual (see above.)
1840	Agricultural and General	1842	
,,	Benevolent	,,	
,,	British Australian and General ...	1841	
,,	Church of England	1893	Afterwards England. Trans. to Imperial.
,,	Commercial (No. 2)	1846	Transferred to Standard.
,,	General Invalid	...	Never fully developed.
,,	Philanthropic	1842	
,,	Provident Clerks	Existing	
,,	Reliance Mutual	1893	Trans. to Norwich Union.

THIRD PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1840	Farmers and General	1888	Became Royal Farmers in 1843. Transferred to Alliance.
,,	United Kingdom Total Abstinence Life Association.	Existing	Became United Kingdom Temperance General and Provident in 1849.
1841	Achilles (No. 1)	1844	Trans. to Great Britain.
,,	Commercial and General	1853	Transferred to London Assurance.
,,	National Invalid and General ...	1860	Transferred to Albert.
,,	National of Scotland	1878	Afterwards Scottish National. Amalgam. with Scottish Union.
,,	New Equitable (No. 1)	1842	
,,	Productive	,,	
,,	South of England	1847	Trans. to Britannia.
,,	Wesleyan Provident	Existing	Afterwards Wesleyan and General.
1842	Anchor	1849	Transferred to Anchor Fire and Life.
,,	British, Literary, Scientific and General.	...	Never completely estab.
,,	English (No. 1)	...	,,
,,	London and County	1842	
,,	Oriental and General	,,	
,,	Western	1865	Transferred to Albert.
1843	Candidate	1844	
,,	Experience	1850	Transferred to Standard.
,,	Mariners and General	1847	Transferred to Eagle.
,,	Star (No. 2)...	Existing	

FOURTH PERIOD.

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1844	British Mutual	1868	Trans. to Prudential.
,,	Cambrian	...	Never completely established.
,,	East of Scotland	1852	Transferred to Colonial.
,,	Equity and Law	Existing	
,,	Great Britain Mutual	1880	Wound up. Contracts transferred to National of Ireland.
,,	Irish Provident	Unknown	
,,	Mercantile (Scotch)	1850	Trans. to Life Association of Scotland.
,,	Merchants and Traders	1858	Transferred to Bank of London.
,,	Monetary (No. 1)	,,	
,,	National Assurance and Investment.	1861	Transferred to Waterloo.
,,	North of England	1858	Transferred to Liverpool and London.
,,	Preserver		
,,	Scottish Freemasons	1848	Trans. to Northern.
,,	Scottish Life and Guarantee ...	,,	Transferred to Mercantile of Scotland.
,,	Western (Scotch)	1847	Trans. to Northern.
1845	Agriculturist	1848	,,
,,	Bon Accord (Aberdeen)	1849	,,
,,	Cambrian and General	Unknown	
,,	City of London	1855	Transferred to Eagle.
,,	Economic Mutual	1845	
,,	England Invalid Hazard	1846	
,,	English, Cambrian and General ...	...	Merged into English and Cambrian.
,,	Glasgow Assurance	1848	Trans. to Edinburgh.
,,	Halifax, Bradford and Keighley ...	1853	Trans. to the Unities.
,,	Legal and Commercial	1857	Trans. to Victoria (No. 1)
,,	National Church	1846	
,,	Operatives and General	,,	
,,	Practicable and General Invalid ...	,,	
,,	Preston and North Lancashire ...	1848	Transferred to Sun.
,,	Royal	Existing	
,,	Sheffield, Rotherham and Chesterfield.	1858	Transferred to Liverpool and London.
,,	Solicitors and General	1866	Transferred to Eagle.
,,	Sovereign	1890	Wound up. Contracts transferred to Sun.
,,	United Deposit	1853	Transferred to Scottish National.
,,	Widows' National and General ...	1846	
1846	Brighton and Sussex	...	Became registered under Friendly Societies Acts.
,,	British and Colonial Trust ...	Unknown	
,,	Catholic Law and General ...	1857	Transferred to Phœnix.
,,	Christian Mutual Provident ...	1858	Became Mutual Provident.

FOURTH PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1846	Colonial and General	1847	Transferred to Standard.
,,	Colonial	1866	,,
,,	Consolidated	1865	Trans. to Prudential.
,,	Deposit Assurance (Aberdeen) ...	1848	
,,	India and London	1860	Transferred to People's Provident.
,,	Liverpool Imperial...	Unknown	
,,	London and Provincial Law ...	1883	Transferred to Guardian.
,,	Medical, Legal and General ...	1857	Transferred to New Equitable (No. 2).
,,	Mercantile	1850	Trans. to Life Association of Scotland.
,,	Mitre	Unknown	
,,	Mutual Legal and General ...	1847	
,,	National Friendly	1853	Trans. to Protestant.
,,	Tontine	1849	Transferred to Engineers and Masonic.
1847	Architects, Builders, &c.	1850	Became British. Trans. to Lancashire in 1853.
,,	British Empire (No. 2)	Existing	
,,	Defender and General	1858	Transferred to Leeds and Yorkshire.
,,	English Widows	1860	Trans. to British Nation.
,,	Etonian and General	1850	Trans. to Equity & Law.
,,	Friendly Insurance Society (Aberdeen).	...	Became enrolled under Friendly Societies Acts.
,,	London and Provincial	1853	Transferred to Legal and Commercial.
,,	Mutual Provident Alliance ...	Existing	
,,	North of England	1858	Transferred to Liverpool and London.
,,	People's Assurance...	1848	Trans. to City of London.
,,	Professional...	1861	Transferred to European.
1848	Ægis (No. 2)	1854	Transferred to Mitre.
,,	British Prudential	Existing	Afterwards Prudential.
,,	Engineers', Masonic and General	1858	Transferred to English and Irish Church.
,,	Gresham	Existing	
,,	Independent	1850	
,,	Indisputable (No. 1)	1857	Transferred to Eagle.
,,	Law Guarantee and Life	...	Never completely estab.
,,	Mentor (No. 2)	1855	Transferred to Eagle.
,,	Metropolitan Counties	1862	Transferred to Western.
,,	Phœnix	1860	Trans. to British Nation.
,,	Preceptors and General	1849	Transferred to Albert.
,,	United Traders	Unknown	
1849	Anchor	1857	Trans. to Bank of London
,,	Cambrian and Universal	,,	Transferred to Mitre.
,,	County Mutual	1853	Trans. to City of London.
,,	East of England (Chelmsford) ...	1858	Transferred to Reliance Mutual.
,,	Friendly Life Assurance	...	Became enrolled under Friendly Societies Acts.

FOURTH PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1849	Industrial and General	1855	Transferred to People's Provident.
,,	Kent Mutual	1861	Transferred to Albert.
,,	London Mutual	1857	Transferred to Eagle.
,,	Railway and General Provident ...	Unknown	Became enrolled under Friendly Societies Acts.
,,	Railway Mutual	...	,,
,,	Times	1857	Transferred to Albert.
,,	United Guarantee and Life ...	1854	Transferred to People's Provident.
,,	United Mutual Mining	1857	,,
,,	Universal Emigration	1852	
,,	Universal Provident (No. 1) ...	1855	Trans. to Engineers.
1850	British Provident	1859	Trans. to British Nation.
,,	Catholic Guild	1852	
,,	Church of England Schoolmasters	Unknown	Transferred to Church of England.
,,	Colonization	,,	
,,	English and Cambrian (No. 2) ...	1856	Trans. to Commercial.
,,	Industrial Mutual Sickness ...	1862	Became New Equitable (No. 2). Trans. to Briton
,,	Law Property	1898	
,,	National Guardian (No. 1) ...	1857	Transferred to Albert.
,,	Trafalgar	1854	Transferred to Unity General.
,,	United Service and General ...	1857	Transferred to People's Provident.
1851	Age	1856	Amal. with Engineers.
,,	Athenæum	,,	Transferred to People's Provident.
,,	British Union	Unknown	
,,	Deposit and General	1856	Trans. to City of London.
,,	Exchequer and Railway	1852	
,,	Kent Mutual	1861	Transferred to Albert.
,,	London and County	1856	Wound up in Chancery.
,,	Monetary (No. 2)	1852	
,,	National Provincial	1856	Amalgam. with Bank of London.
,,	New Protector	1859	Became British Protector in 1853. Transferred to Sovereign.
,,	Oak Mutual...	1856	Amalgam. with London and County.
,,	Prince of Wales	1857	Transferred to People's Provident.
,,	Schoolmasters and General ...	1859	Transferred to Church of England.
,,	Waterloo	1862	Trans. to British Nation.
1852	Adamant	1853	
,,	Annual Bonus	,,	
,,	Ark (No. 2)...	,,	
,,	Birkbeck	1857	Transferred to Home Counties.

FOURTH PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1852	British Industry	1860	Transferred to British Prudential.
,,	Emperor	1886	Revived in 1882. Transferred to Whittington.
,,	Era	1858	Trans. to Law Property.
,,	Hope Mutual	1855	Transferred to Mitre.
,,	Householders' and General ...	1858	Transferred to English and Irish Church.
,,	Industrial (No. 1)	1853	
,,	Lancashire	Existing	
,,	Marine and General	,,	
,,	Pecuniary Aid	1853	
,,	Protestant	1856	Trans. to City of London.
,,	Provincial (Welsh)	1890	Transferred to Alliance.
,,	Sceptre of England	1853	
,,	Scottish Legal	Existing	Became enrolled under Friendly Societies Acts.
,,	Wellington	1863	Trans. to British Nation.
1853	Accumulative	1853	Merged into Anglo-Australian.
,,	Achilles (No. 2)	1858	Trans. to City of London.
,,	Amazon	1854	Wound up in Chancery.
,,	Anglo-Australian	1858	Transferred to British Provident.
,,	Beacon	1856	Transferred to Albert.
,,	British Protector	1839	Trans. to Sovereign.
,,	Briton, Medical and General ...	1892	Wound up. Contracts transferred to Sun.
,,	Caxton	1856	Wound up in Chancery.
,,	Commonwealth	1854	
,,	Eclipse	1856	
,,	English and Irish Church	1861	Trans. to British Nation.
,,	General Indemnity	1857	Trans. to Commercial.
,,	Home Counties and General ...	,,	Trans. to Whittington.
,,	Lombard Advance, &c.	1854	
,,	London Exchange	Unknown	
,,	London Mercantile Exchange ...	1855	Transferred to East of England.
,,	Manchester and London	1862	Trans. to Western Life.
,,	Official and General	1854	Transferred to National Guardian.
,,	People's	,,	Transferred to People's Provident.
,,	Protector and Endowment ...	1884	Went into liquidation.
,,	Realm	1854	
,,	Self-Reliance	,,	
,,	Universal Provident (No. 2) ...	1855	Became Railway and General Provident. Trans. to European.
1854	British Equitable	Existing	
,,	British Nation	1865	Amal. with European (No. 2).
,,	Civil Service, Miners', &c. ...	1855	

FOURTH PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1854	Diadem	1857	Transferred to British Provident.
,,	Durham and Northumberland ...	1856	Trans. to Bank of London
,,	Empire (No. 1)	1857	Transferred to Family Endowment.
,,	Falcon	1856	Trans. to Bank of London
,,	Law Union	1892	Amalgam. with Crown.
,,	London and Continental	1859	Trans. to St. George.
,,	Magnet	,,	Transferred to Waterloo.
,,	Marylebone and General	1854	Transferred to English and Foreign.
,,	Mercantile Provincial	,,	
,,	Midland Counties	1892	Transferred to Royal.
,,	Nelson Sea Voyages	1855	
,,	New National	1865	Transferred to National Guardian.
,,	Operative Mutual	1881	Became National Industrial in 1855.
,,	People's Provident...	1872	Became European (No. 2) Wound up.
,,	Safety	1859	Trans. to Sovereign.
,,	St. George	1861	Trans. to Metropolitan Counties.
,,	Saxon	1856	Transferred to Era.
,,	Security Mutual	,,	Wound up in Chancery.
,,	Unity General	1862	Transferred to Briton.
1855	Brunswick	1857	,,
,,	Cosmopolitan	1856	Wound up in Chancery.
,,	Deposit Assurance	1861	Trans. to Waterloo.
,,	Female Provident	1857	
,,	Hull and London	,,	Went into liquidation.
,,	Justice	1856	Wound up in Chancery.
,,	Life Assurance Treasury	1861	Trans. to Waterloo.
,,	London Equitable (No. 2) ...	1863	Trans. to British Nation.
,,	London and Provincial Provident	1861	,,
,,	National Alliance	1859	Trans. to Sovereign.
,,	New Alliance	1859	Became British & Foreign Alliance. Trans. to Law Property.
,,	Royal Star Life Sickness and Medical.	...	Became registered under Friendly Societies Acts.
,,	United Friendly Brothers... ...	Unknown	
,,	United Homœopathic	1856	Became English Provident (No. 1).
,,	United Orders	,,	
,,	United Traders	1859	Became National Mutual (No. 1).
,,	Whittington...	1892	Transferred to National.
1856	Absolute (No. 1)	1857	Transferred to City of London.
,,	Bank of London	1858	Transferred to Albert.
,,	British Exchequer	,,	Transferred to British, Foreign and Colonial.

FOURTH PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1856	Commercial (No. 3)	1857	Transferred to English Widows.
,,	Confident	1864	Transferred to General Provident.
,,	Constitution...	1857	Transferred to Emperor.
,,	Engineers and Age...	1859	Transferred to English and Irish Church.
,,	English Provident (No. 1) ...	1857	Trans. to Kent Mutual.
,,	Exchange	,,	
,,	Herald (No. 1)	1860	Wound up in Chancery.
,,	Observer	1857	Trans. to City of London.
,,	Registrar's and General	...	Became registered under Friendly Societies Acts.
1857	British Amicable	1858	
,,	British, Foreign and Colonial ...	1859	Transferred to Consols.
,,	British Shield	1857	Trans. to London and Provincial Provident.
,,	Queen	1891	Amalgam. with Royal.
1858	Consols	1862	Transferred to Provident Clerks.
,,	Herald (No. 2)	1860	Wound up in Chancery.
,,	Integrity	...	Became registered under Friendly Societies Acts.
,,	Mercantile Life and Guarantee ...	1859	Went into Chancery.
,,	People's Universal...	...	Became registered under Friendly Societies Acts.
,,	World	1863	Transferred to City and County.
1859	People's Family Life (Dudley) ...	Existing	Became registered under Friendly Societies Acts.
,,	Public	1862	Transferred to City Life.
,,	Wigan Life and Endowment ...	...	Became registered under Friendly Societies Acts.
1860	British Isles...	1861	
,,	Indisputable (No. 2)	1866	Transferred to Briton.
,,	Victoria Provident Society ...	Existing	Registered in 1882 as Victoria Mutual.
1861	Commercial Union...	,,	
,,	Family Assurance and Sick Fund	1863	
,,	General Annuity and Life... ...	1866	Transferred to Sovereign.
,,	Norwich Provident...	Unknown	Wound up in Chancery.
,,	Royal London Friendly	Existing	Became registered under Friendly Societies Acts.
,,	Volunteer Service	1865	Trans. to North British.
,,	Western Counties and London (Plymouth).	1889	Transferred to British Empire Mutual.

FIFTH PERIOD.

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1862	Birmingham and Midland... ...	1865	Merged into British Alliance.
,,	British Union, Limited	,,	Transferred to Empire.
,,	British Workman's (Walsall) ...	Existing	Became enrolled under Friendly Societies Acts.
,,	City	1866	Transferred to Sovereign.
,,	General Provident	1862	Transferred to Etna.
,,	Lewes Mutual Assurance Benefit...	...	Became enrolled under Friendly Societies Acts.
,,	London and Lancashire	Existing	
,,	Southampton Mutual	1867	Transferred to Sceptre.
,,	Yorkshire, Lancashire and Midland	1865	Transferred to Provincial Union.
1863	Albion (No. 2)	1878	Wound up.
,,	British Legal	Existing	
,,	British Standard (No. 1)	1869	Transferred to Bristol and London.
,,	City and County	1866	Transferred to Empire.
,,	City of London and General ...	...	Projected only.
,,	County	1867	Transferred to Imperial Union.
,,	English Union	...	Projected only.
,,	Friend-in-Need	1866	Transferred to Empire.
,,	Hercules	1869	Trans. to Prudential.
,,	Life Association of England ...	1863	Wound up.
,,	Mercantile Union	1864	Transferred to European.
,,	National Union	1868	Trans. to Great Britian.
,,	Newcastle and Northern Counties	...	Projected only.
1864	Financial	1866	Trans. to Whittington.
,,	General Provident	1867	,,
,,	Home and Colonial	1866	Trans. to Northern.
,,	Life Investment	1867	Transferred to London and Northern.
,,	London and Southwark	1879	Trans. to London and Lancashire.
,,	Mercantile, Professional and General.	1865	Transferred to National Standard.
,,	Pearl...	Existing	
,,	Refuge	,,	
,,	Sceptre	,,	
,,	United Counties	1867	Wound up.
1865	Accidental and Marine	1869	,,
,,	British and Colonial	...	Projected only.
,,	East London	...	,,
,,	Empire (No. 2)	1867	
,,	English (No. 2)	...	,,
,,	General Homœopathic	...	,,
,,	Insurance Corporation of Great Britain.	...	,,
,,	London and Northern	...	,,
,,	London Scottish	...	,,
,,	National Guardian (No. 2) ...	Existing	
,,	National Standard	1866	Trans. to Financial.

FIFTH PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1865	Provident Union	1868	Wound up.
,,	Scottish Imperial	Existing	
,,	Surrey	...	Projected only.
,,	United Service	...	,,
,,	United Assurance and Investment	...	,,
1866	British Workman's and General ...	Existing	
,,	Imperial Union	1882	
,,	Industrial (No. 2)	...	,,
,,	London and Manchester	1869	Transferred to London and Manchester Industrial.
,,	Manchester Provident	1876	Wound up.
,,	Northern Patriotic	...	Projected only.
,,	Planet	1874	Became Citizen in 1872. Wound up. Contracts transferred to Provident Clerks'.
,,	Prosperous	...	Projected only.
,,	Sheffield and Lincoln	...	,,
,,	United English and Scottish ...	...	,,
,,	United Kingdom Assurance Corporation.	1889	Trans. to London, Edinburgh and Glasgow.
1867	Amicable Mutual	1868	Trans. to United Ports.
,,	Colonial (No. 2)	1881	Trans. to London, Edinburgh and Glasgow.
,,	English (No. 3)	1871	Transferred to North American.
,,	Imperial Guardian	1869	Trans. to Great Britain.
,,	Legal, Medical and Universities ...	...	Projected only.
,,	Methodist and General	Existing	
,,	National Widows' Fund	1869	Transferred to National Widows' Life Assur. Fund.
,,	Permanent	...	Projected only.
,,	Progress	1869	Trans. to United Ports.
,,	Re-Insurance	1871	Wound up.
,,	Residential	...	Projected only.
,,	Scottish Economic (No. 1) ...	...	
,,	Unconditional	1868	Transferred to British Alliance.
1868	Alexandra Mutual	1872	Transferred to Masonic and General.
,,	Anchor Industrial	...	Projected only.
,,	Bristol and South Western Co-operative.	...	,,
,,	British Alliance	1878	Wound up.
,,	British Imperial	1875	,,
,,	British Standard (No. 2)	1869	Transferred to Bristol and London.
,,	Home	1871	Wound up.
,,	Incorporated Association of England and Scotland.	...	Projected only.
,,	Leicester Mutual	...	,,

FIFTH PERIOD—*Continued.*

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1868	Life Assurance Union	...	Projected only.
,,	Liverpool, Manchester and Birmingham.	...	,,
,,	Masonic and General	1886	Wound up.
,,	Monarch Investment	1870	Transferred to London and Glasgow.
,,	National Provincial	1869	Wound up.
,,	Prudent	1869	Transferred to Home.
,,	Queen of England	...	Projected only.
,,	United Kingdom Provident ...	1871	
,,	United Ports	1869	Wound up. Contracts transferred to English.
1869	Bristol and London	1875	Trans. to Great Britain.
,,	British Universal	1869	
,,	Catholic	...	Projected only.
,,	English Provident (No. 2) ...	...	,,
,,	London and Manchester Industrial	Existing	
,,	Manchester Insurance and Banking	...	,,
,,	National and Provincial Union ...	...	,,
,,	National Equitable Provident ...	...	,,
,,	National Widows' Life Assurance Fund.	1872	Wound up.
1870	Aid	...	Projected only.
,,	Albert Reconstruction	...	,,
,,	Art Assurance Company of Scotland	1875	Wound up.
,,	British (No. 1)	1878	
,,	Exchange Advance and Investment	1884	Became City Life in 1878. Transferred to Swansea Royal F. S.
,,	Leviathan	...	Projected only.
,,	Lion (No. 1)	1875	Wound up.
,,	London, East India and Colonial	1883	
,,	London and Birmingham	1874	
,,	London and Glasgow	1871	Formerly Monarch Investment.
,,	Minerva Banking Company ...	1876	Became National Funds in 1872.
,,	Monthly	1890	Dissolved.
,,	New Albert	1883	Became Security in 1872.
,,	New Amicable	1875	Wound up.
,,	North London	...	Projected only.
,,	Positive Government Security ...	1895	Transferred to British Empire Mutual.
,,	Yorkshire Provident	Existing	

SIXTH PERIOD.

Date of Establishment.	Title.	Date of Discontinuance.	Remarks.
1875	Briton	1886	Transferred to Marine and General.
1876	Scottish Metropolitan	Existing	
1878	Scottish Union and National ...	,,	Formed by amalgam. of Scottish Union and Scottish National.
1880	Lion (No. 2)	1883	Transferred to British Empire Mutual.
1881	London, Edinburgh and Glasgow	Existing	
,,	Scottish Life	,,	
1883	Blue Ribbon	,,	Became Abstainers and General in 1890.
,,	Scottish Temperance	,,	
1885	Scottish Economic (No. 2) ...	1889	Transferred to Scottish Metropolitan.
1886	Co-operative	Existing	Originally estab. in 1867.
1887	London Amicable	1894	Transferred to Scottish Metropolitan.
1889	Provident Free Home	Existing	
1891	British Natural Premium	,,	
,,	Pioneer	,,	
,,	Sun of India	1897	Transferred to Sun Life.
1892	Law Union and Crown	Existing	Formed by amalgam. of Law Union and Crown.
1894	Absolute (No. 2)	,,	
1895	National Mutual	,,	Formed by amalgam. of National and Mutual.
,,	Scottish Accident	,,	Estab. as an Accident Company in 1877.
1896	British (No. 2)	,,	
,,	Vulcan Boiler and General ...	,,	Originally estab. in 1859.
1897	British Homes	,,	
,,	New Era	,,	
,,	Sickness, Accident and Life ...	,,	Estab. as an Accident Company in 1885.
1898	Life and Health	,,	
1900	United Provident	,,	

APPENDIX B.

PRINCIPAL ENACTMENTS RELATING TO LIFE ASSURANCE COMPANIES.

(1) Policies of Assurance Act, 1867.

(2) Life Assurance Companies Acts, 1870 to 1872.

(3) Married Women's Property Act, 1870. Section 10.

(4) Married Women's Policies of Assurance (Scotland) Act, 1880.

(5) Married Women's Property Act, 1882. Section 11.

Policies of Assurance Act, 1867.

[30 *and* 31 *Vict., Chap.* 144. 20*th August,* 1867.]

WHEREAS it is expedient to enable assignees of policies of life assurance to sue thereon in their own names: Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

Assignees of life policies may sue in their own names.

1. Any person or corporation now being or hereafter becoming entitled, by assignment or other derivative title, to a policy of life assurance, and possessing at the time of action brought the right in equity to receive and the right to give an effectual discharge to the assurance company liable under such policy for monies thereby assured or secured, shall be at liberty to sue at Law in the name of such person or corporation to recover such monies.

Defence or reply on equitable grounds may be pleaded.

2. In any action on a policy of life assurance, a defence on equitable grounds, or a reply to such defence on similar grounds, may be respectively pleaded and relied upon in the same manner and to the same extent as in any other personal action.

Notice of assignment to be given.

3. No assignment made after the passing of this Act of a policy of life assurance shall confer on the assignee therein named, his executors, administrators, or assigns, any right to sue for the amount of such policy, or the monies assured or secured thereby, until a written notice of the date and purport of such assignment shall have been given to the assurance company liable under such policy at their principal place of business for the time being, or in case they have two or more principal places of business, then at some one of such principal places of business, either in *England* or *Scotland* or *Ireland,* and the date on which such notice shall be received shall regulate the priority of all claims under any assignment; and a payment *bonâ fide* made in respect of any policy by any assurance company before the date on which such notice shall have been received shall be as valid against the assignee giving such notice as if this Act had not been passed.

Principal places of business to be specified on policies.

4. Every assurance company shall, on every policy issued by them after the Thirtieth Day of *September,* One thousand eight hundred and sixty-seven, specify their principal place or principal places of business at which notices of assignment may be given in pursuance of this Act.

Assignment by endorsement or separate instrument.

5. Any such assignment may be made either by endorsement on the policy or by a separate instrument in the words or to the effect set forth in the schedule hereto, such endorsement or separate instrument being duly stamped.

Notices of assignment to be acknowledged.

6. Every assurance company to whom notice shall have been duly given of the assignment of any policy under which they are liable shall, upon the request in writing of any person by whom any such notice was given or signed, or of his executors or administrators, and upon payment in each case of a fee not exceeding Five Shillings, deliver an acknowledgment in writing under the hand of the manager, secretary, treasurer, or other principal officer of the assurance company of their receipt of such notice; and every such written acknowledgment, if signed by a person being *de jure* or *de facto* the manager, secretary, treasurer, or other principal officer of the assurance company whose acknowledgment the same purports to be, shall be conclusive evidence as against such assurance company of their having duly received the notice to which such acknowledgment relates.

Interpretation of terms.

7. In the construction and for the purposes of this Act the expression "Policy of Life Assurance," or "Policy," shall mean any instrument by which the payment of monies, by or out of the funds of an assurance company, on the happening of any contingency depending on the duration of human life, is assured or secured; and the expression "Assurance Company" shall mean and include every corporation, association, society, or company, now or hereafter carrying on the business of assuring lives or survivorships, either alone or in conjunction with any other object or objects.

Not to apply to contracts under certain Acts.

8. Provided always, That this Act shall not apply to any policy of assurance granted or to be granted or to any contract for a payment on death entered into or to be entered into in pursuance of the Provisions of the Acts Sixteenth and Seventeenth *Victoria*, Chapter Forty-five, and Twenty-seventh and Twenty-eighth *Victoria*, Chapter Forty-three, or either of those Acts, or to any engagement for payment on death by any Friendly Society.

Short title.

9. For all purposes this Act may be cited as "The Policies of Assurance Act, 1867."

Schedule.

I *A.B.* of, *&c.*, in consideration of, *&c.*, do hereby assign unto *C.D.* of, *&c.*, his executors, administrators, and assigns, the [within] policy of assurance granted, *&c.* [*here describe the policy*]. In witness, &c.

Life Assurance Companies Act, 1870.

[33 *and* 34 *Vict., Chap.* 61. 9*th August*, 1870.]

BE it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

Short title.

1. This Act may be cited as "The Life Assurance Companies Act, 1870."

Interpretation of terms.

2. In this Act—

The term "company" means any person or persons, corporate or unincorporate, not being registered under the Acts relating to friendly societies, who issue or are liable under policies of assurance upon human life within the United Kingdom, or who grant annuities upon human life within the United Kingdom:

The term "chairman" means the person for the time being presiding over the court or board of directors of the company:

The term "policyholder" means the person who for the time being is the legal holder of the policy for securing the life assurance, endowment, annuity, or other contract with the company:

The term "financial year" means each period of twelve months at the end of which the balance of the accounts of the company is struck, or if no such balance is struck, then each period of twelve months ending with the thirty-first day of December:

The term "Court" means, in the case of a company registered or having its head office in England, the High Court of Chancery; in the case of a company registered or having its head office in Ireland, the Court of Chancery in Ireland; in all cases of companies registered or having its head office in Scotland, the Court of Session, in either division thereof:

The term "registrar" means the Registrar of Joint Stock Companies in England and Scotland, and the Assistant Registrar of Joint Stock Companies in Ireland.

Depo

3. Every company established after the passing of this Act within the United Kingdom, and every company established or to be established out of the United Kingdom which shall after the passing of this Act commence to carry on the business of life assurance within the United Kingdom, shall be required to deposit the sum of twenty thousand pounds with the Accountant General of the Court

of Chancery, to be invested by him in one of the securities usually accepted by the Court for the investment of funds placed from time to time under its administration, the company electing the particular security and receiving the income therefrom, and the registrar shall not issue a certificate of incorporation unless such deposit shall have been made, and the Accountant General shall return such deposit to the company so soon as its life assurance fund accumulated out of the premiums shall have amounted to forty thousand pounds.

Life funds separate.

4. In the case of a company established after the passing of this Act transacting other business besides that of life assurance, a separate account shall be kept of all receipts in respect of the life assurance and annuity contracts of the company, and the said receipts shall be carried to and form a separate fund to be called the life assurance fund of the company, and such fund shall be as absolutely the security of the life policy and annuity holders as though it belonged to a company carrying on no other business than that of life assurance, and shall not be liable for any contracts of the company for which it would not have been liable had the business of the company been only that of life assurance; and in respect to all existing companies, the exemption of the life assurance fund from liability for other obligations than to its life policyholders shall have reference only to the contracts entered into after the passing of this Act, unless by the constitution of the company such exemption already exists: Provided always, that this section shall not apply to any contracts made by any existing company by the terms of whose deed of settlement the whole of the profits of all the business are paid exclusively to the life policyholders, and on the face of which contracts the liability of the assured distinctly appears.

Statements to be made by companies.

5. From and after the passing of this Act every company shall, at the expiration of each financial year of such company, prepare a statement of its revenue account for such year, and of its balance sheet at the close of such year, in the forms respectively contained in the first and second schedules to this Act.

Statements by company doing other than life business.

6. Every company which, concurrently with the granting of policies of assurance or annuities on human life, transacts any other kind of assurance or other business shall, at the expiration of each such financial year as aforesaid, prepare statements of its revenue account for such year, and of its balance sheet at the close of such year, in the forms respectively contained in the third and fourth schedules of this Act.

Actuarial report and abstract.

7. Every company shall, once in every five years if established after the passing of this Act, and once every ten years if established before the passing of this Act, or at such shorter intervals as may be prescribed by the instrument constituting the company, or by its regulations or byelaws, cause an investigation to be made into its financial condition by an actuary, and shall cause an abstract of the report of such actuary to be made in the form prescribed in the fifth schedule to this Act.

Statement of life and annuity business.

8. Every company shall, on or before the thirty-first day of December one thousand eight hundred and seventy-two, and thereafter within nine months after the date of each such investigation as aforesaid into its financial condition, prepare a statement of its life assurance and annuity business in the form contained in the sixth schedule to this Act, each of such statements to be made up as at the date of the last investigation, whether such investigation be made previously or subsequently to the passing of this Act: Provided as follows:

(1) If the next financial investigation after the passing of this Act of any company fall during the year one thousand eight hundred and seventy-three, the said statement of such company shall be prepared within nine months after the date of such investigation, instead of on or before the thirty-first day of December one thousand eight hundred and seventy-two:

(2) If such investigation be made annually by any company, such company may prepare such statement at any time, so that it be made at least once in every three years.

The expression date of each such investigation in this section shall mean the date to which the accounts of each company are made up for the purposes of each such investigation.

Forms may be altered.

9. The Board of Trade, upon the applications of or with the consent of a company, may alter the forms contained in the schedules to this Act, for the purpose of adapting them to the circumstances of such company, or of better carrying into effect the objects of this Act.

Statements, &c., to be signed and printed and deposited with Board of Trade.

10. Every statement or abstract herein-before required to be made shall be signed by the chairman and two directors of the company and by the principal officer managing the life assurance business, and, if the company has a managing director, by such managing director, and shall be printed; and the original, so signed as aforesaid, together with three printed copies thereof, shall be deposited at the Board of Trade within nine months of the dates respectively herein-before prescribed as the dates at which the same are to be prepared. And every annual statement so deposited after the next investigation shall be accompanied by a printed copy of the abstract required to be made by section seven.

Copies of statements to be given to Shareholders, &c.

11. A printed copy of the last deposited statement, abstract, or other document by this Act required to be printed shall be forwarded by the company, by post or otherwise, on application, to every shareholder and policyholder of the company.

List of Shareholders.

12. Every company which is not registered under "The Companies Act, 1862," and which has not incorporated in its deed of settlement section ten of "The Companies Clauses Consolidation Act, 1845," shall keep a "Shareholders' Address Book," in accordance with the provisions of that section, and shall furnish, on application, to every shareholder and policyholder of the company a copy of such

book, on payment of a sum not exceeding sixpence for every hundred words required to be copied for such purpose.

Deed of settlement to be printed.

13. Every company which is not registered under "The Companies Act, 1862," shall cause a sufficient number of copies of its deed of settlement to be printed, and shall furnish, on application, to every shareholder and policyholder of the company a copy of such deed of settlement on payment of a sum not exceeding two shillings and sixpence.

Amalgamation or transfer.

14. Where it is intended to amalgamate two or more companies, or to transfer the life assurance business of one company to another, the directors of any one or more of such companies may apply to the Court, by petition, to sanction the proposed arrangement, notice of such application being published in the Gazette, and the Court, after hearing the directors and other persons whom it considers entitled to be heard upon the petition, may confirm the same if it is satisfied that no sufficient objection to the arrangement has been established.

Before any such application is made to the Court a statement of the nature of the amalgamation or transfer, as the case may be, together with an abstract containing the material facts embodied in the agreement or deed under which such amalgamation or transfer is proposed to be effected, and copies of the actuarial or other reports upon which such agreement or deed is founded, shall be forwarded to each policyholder of both companies in case of amalgamation, or to each policyholder of the transferred company in case of transfer, by the same being transmitted in manner provided by section one hundred and thirty-six of "The Companies Clauses Consolidation Act, 1845," for the transmission to shareholders of notices not requiring to be served personally; and the agreement or deed under which such amalgamation or transfer is effected shall be open for the inspection of the policyholders and shareholders at the office or offices of the company or companies for a period of fifteen days after the issuing of the abstract herein provided.

The Court shall not sanction any amalgamation or transfer in any case in which it appears to the Court that policyholders representing one tenth or more of the total amount assured in any company which it is proposed to amalgamate, or in any company the business of which it is proposed to transfer, dissent from such amalgamation or transfer.

No company shall amalgamate with another, or transfer its business to another, unless such amalgamation or transfer is confirmed by the Court in accordance with this section.

Provided always, that this section shall not apply in any case in which the business of any company which is sought to be amalgamated or transferred does not comprise the business of life assurance.

Statements in case of amalgamation or transfer.

15. When an amalgamation takes place between any companies, or when the business of one company is transferred to another company, the combined company or the purchasing company, as the case may be, shall, within ten days from the date of the completion of the amalgamation or transfer, deposit with the Board of Trade certified copies

of statements of the assets and liabilities of the companies concerned in such amalgamation or transfer, together with a statement of the nature and terms of the amalgamation or transfer, and a certified copy of the agreement or deed under which such amalgamation or transfer is effected, and certified copies of the actuarial or other reports upon which such agreement or deed is founded; and the statement and agreement or deed of amalgamation or transfer shall be accompanied by a declaration under the hand of the chairman of each company and the principal managing officer of each company, that to the best of their belief every payment made or to be made to any person whatsoever on account of the said amalgamation or transfer is therein fully set forth, and that no other payments beyond those set forth have been made or are to be made either in money, policies, bonds, valuable securities, or other property by or with the knowledge of any parties to the said amalgamation or transfer.

Documents may be transferred from Board of Trade to registry of Joint Stock Companies.

16. The Board of Trade may direct any printed or other documents required by this Act, or certified copies thereof, to be kept by the registrar of Joint Stock Companies or other officer of the Board of Trade; and any person may, on payment of such fees as the Board of Trade may direct, inspect the same at his office, and procure copies thereof.

Documents to be received in evidence.

17. Every statement, abstract, or other document deposited with the Board of Trade or with the registrar of Joint Stock Companies under this Act shall be receivable in evidence; and every document purporting to be certified by one of the secretaries or assistant secretaries of the Board of Trade, or by the said registrar, to be such deposited document, and every document purporting to be similarly certified to be a copy of such deposited document, shall, if produced out of the custody of the Board of Trade or of the said registrar, be deemed to be such deposited document as aforesaid, or a copy thereof, and shall be received in evidence as if it were the original document, unless some variation between it and the original document shall be proved.

Penalty for non-compliance with Act.

18. Every company which makes default in complying with the requirements of this Act shall be liable to a penalty not exceeding fifty pounds for every day during which the default continues; and if default continue for a period of three months after notice of default by the Board of Trade, which notice shall be published in one or more newspapers as the Board of Trade may direct, and after such publication the Court may order the winding-up of the company, in accordance with "The Companies Act, 1862," upon the application of one or more policyholders or shareholders.

Penalty for falsifying statements, &c.

19. If any statement, abstract, or other document required by this Act is false in any particular to the knowledge of any person who signs the same, such person shall be liable on conviction thereof on indictment to fine and imprisonment, or on summary conviction thereof to a penalty not exceeding fifty pounds.

Penalties how to be recovered and applied.

20. Every penalty imposed by this Act shall be recovered and applied in the same manner as penalties imposed by "The Companies Act, 1862," are recoverable and applicable.

Other circumstances under which company may be wound up by the Court of Chancery

21. The Court may order the winding-up of any company, in accordance with "The Companies Act, 1862," on the application of one or more policyholders or shareholders, upon its being proved to the satisfaction of the Court that the company is insolvent, and in determining whether or not the company is insolvent the Court shall take into account its contingent or prospective liability under policies and annuity and other existing contracts; but the Court shall not give a hearing to the petition until security for costs for such amount as the judge shall think reasonable shall be given, and until a primâ facie case shall also be established to the satisfaction of the judge; and in the case of a proprietary company having an uncalled capital of an amount sufficient with the future premiums receivable by the company to make up the actual invested assets equal to the amount of the estimated liabilities, the Court shall suspend further proceeding on the petition for a reasonable time (in the discretion of the Court) to enable the uncalled capital, or a sufficient part thereof, to be called up; and if at the end of the original or any extended time for which the proceedings shall have been suspended such an amount shall not have been realised by means of calls as, with the already invested assets, to be equal to the liabilities, an order shall be made on the petition as if the company had been proved insolvent.

Power to to reduce contracts.

22. The Court, in the case of a company which has been proved to be insolvent, may, if it thinks fit, reduce the amount of the contracts of the company upon such terms and subject to such conditions as the Court thinks just, in place of making a winding-up order.

Notices under this Act to policyholders.

23. Any notice which is by this Act required to be sent to any policyholder may be addressed and sent to the person to whom notices respecting such policy are usually sent, and any notice so addressed and sent shall be deemed and taken to be notice to the holder of such policy.

Statemen &c. to be laid before Parliament.

24. The Board of Trade shall lay annually before Parliament the statements and abstracts of reports deposited with them under this Act during the preceding year.

Exceptions.

25. This Act shall not affect the Commissioners for the Reduction of the National Debt, nor the Postmaster General, acting under the authorities vested in them respectively by the Acts tenth George the Fourth, chapter twenty-four, * third and fourth William the Fourth, chapter fourteen, sixteenth and seventeenth Victoria, chapter forty-five, and twenty-seventh and twenty-eighth Victoria, chapter forty-three.

*[*Altere from* forty-one, *pursuant to* 34 & 35, *Vict. c.* 58.]

First Schedule.

Revenue Account of the *for the year ending*

18 . (Date)		£ s. d.	18 . (Date)		£ s. d.
	Amount of funds at the beginning of the year			Claims under policies (after deduction of sums re-assured)	
	Premiums			Surrenders	
	Consideration for annuities granted			Annuities	
	Interest and dividends ..			Commission	
	Other receipts (accounts to be specified)			Expenses of management ..	
				Dividends and bonuses to shareholders (if any) ..	
				Other payments (accounts to be specified)	
				Amount of funds at the end of the year, as per second schedule	
	£			£	

Note 1.—Companies having separate accounts for annuities to return the particulars of their annuity business in a separate statement.

Note 2.—Items in this and in the accounts in the Third and Fifth Schedules should be the net amounts after deduction of the amounts paid and received in respect of re-assurances.

Second Schedule.

Balance Sheet of the *on the* 18 .

Liabilities.	£ s. d.	Assets.	£ s. d.
Shareholders' capital paid up (if any) .. .. £		Mortgages on property within the United Kingdom	
Assurance fund		Do. do. out of the United Kingdom	
Annuity fund (if any) ..		Loans on the company's policies ..	
Other funds, if any, to be specified		Investments:	
Total funds as per first schedule ..		In British Government securities	
Claims admitted but not paid* ..		Indian and Colonial Government securities	
Other sums owing by the company* (accounts to be specified)		Foreign Government securities	
		Railway and other debentures and debenture stocks ..	
		Do. shares (preference and ordinary) ..	
		House property	
		Other investments (to be specified)	
		Loans upon personal security ..	
		Agents' balances	
		Outstanding premiums	
		Do. interest	
		Cash:	
		On deposit .. .. £	
		In hand and on current account ..	
		Other assets (to be specified) ..	
£		£	

* Note.—These items are included in the corresponding items in the First Schedule.

THIRD SCHEDULE.

Revenue Accounts of the *for the year ending*

(No. 1). LIFE ASSURANCE ACCOUNT.

(Date)		£	(Date)		£
	Amount of life assurance fund at the beginning of the year			Claims under life policies (after deduction of sums re-assured)	
	Premiums, after deduction of re-assurance premiums ..			Surrenders	
	Consideration for annuities granted			Annuities	
	Interest and dividends ..			Commission	
	Other receipts (accounts to be specified)			Expenses of management ..	
				Other payments (accounts to be specified)	
				Amount of life assurance fund at the end of the year as per Fourth Schedule	

NOTE.—Companies having separate accounts for annuities to return the particulars of their annuity business in a separate statement.

(No. 2). FIRE ACCOUNT.

		£			£
	Amount of fire insurance fund at the beginning of the year			Losses by fire after deduction of re-assurances	
	Premiums received, after deduction of re-assurances ..			Expenses of management ..	
	Other receipts to be specified			Commission	
				Other payments to be specified	
				Amount of fire insurance fund at the end of the year as per Fourth Schedule ..	

NOTE—When marine or any other branch of business is carried on, the income and expenditure thereof to be in like manner stated in a separate account.

(No. 3). PROFIT AND LOSS ACCOUNT.

		£			£
	Balance of last year's account			Dividends and bonuses to shareholders	
	Interest and dividends not carried to other accounts ..			Expenses not charged to other accounts	
	Profit realised (accounts to be specified)			Loss realised (accounts to be specified)	
	Other receipts			Other payments	
				Balance as per Fourth Schedule	

* NOTE.—This account is not required if the items have been incorporated in the other accounts of this schedule.

Fourth Schedule.

Balance Sheet of the *on the* 18 .

LIABILITIES.	£ s. d.	£ s. d.	ASSETS.	£ s. d.	£ s. d.
Shareholders' capital			Mortgages on property within the United Kingdom		
General reserve fund (if any) ..			Do. do. out of the United Kingdom		
Life assurance fund*			Loans on the company's policies ..		
Annuity fund (if any)*			INVESTMENTS:		
Fire fund			In British Government securities		
Marine fund			Indian and Colonial do.		
Profit and loss (if any)			Foreign do.		
Other funds, if any, to be specified			Railway and other debentures and debenture stocks ..		
	£		Do. shares .. (preference and ordinary) ..		
Claims under life policies admitted but not yet paid* .. .. .. £			House property		
Outstanding fire losses ..			Other investments (to be specified)		
Do. marine do.			Loans upon personal security ..		
Other sums owing by the company (accounts to be specified)			Agents' balances		
			Outstanding premiums		
			Do. interest		
			CASH:		
			On deposit .. .. £		
			In hand and on current account ..		
			Other assets (to be specified) ..		
	£			£	

* If the life assurance fund is, in accordance with section 4 of this Act, a separate trust fund for the sole security of the life policyholders, a separate balance sheet for the life branch may be given in the form contained in Schedule 2. In other respects the company is to observe the above form. See also note to Second Schedule.

Fifth Schedule.

Statement respecting the Valuation of the Liabilities under Life Policies and Annuities of the to be made by the Actuary.

(The answers should be numbered to accord with the numbers of the corresponding questions.)

1. The date up to which the valuation is made.

2. The principles upon which the valuation and distribution of profits among the policyholders are made, and whether these principles were determined by the instrument constituting the company, or by its regulations or bye-laws, or otherwise.

3. The table or tables of mortality used in the valuation.

4. The rate or rates of interest assumed in the calculations.

5. The proportion of the annual premium income, if any, reserved as a provision for future expenses and profits. (If none, state how this provision is made.)

6. The consolidated revenue account since the last valuation, or, in case of a company which has made no valuation, since the commencement of the business. (This return should be made in the form annexed.)

7. The liabilities of the company under life policies and annuities at the date of the valuation, showing the number of policies, the amount assured, and the amount of premiums payable annually under each class of policies, both with and without participation in profits; and also the net liabilities and assets of the company, with the amount of surplus or deficiency. (These returns should be made in the forms annexed.)

8. The time during which a policy must be in force in order to entitle it to share in the profits.

9. The results of the valuation, showing—

(1) The total amount of profit made by the company.

(2) The amount of profit divided among the policyholders, and the number and amount of the policies which participated.

(3) Specimens of bonuses allotted to policies for 100*l.* effected at the respective ages of 20, 30, 40, and 50, and having been respectively in force for five years, ten years, and upwards, at intervals of five years respectively, together with the amounts apportioned under the various modes in which the bonus might be received.

(Form referred to under heading No. 6. in the Fifth Schedule.)

Consolidated Revenue Account of the *for* *years*
commencing *and ending*

	£ s. d.		£ s. d.
Amount of funds on 18 , —the beginning of the year ..		Claims under policies (after deduction of sums re-assured) ..	
Premiums (after deduction of re-assurance premiums)		Surrenders	
Consideration for annuities granted		Annuities	
Interest and dividends		Commission	
Other receipts (accounts to be specified)		Expenses of management	
		Dividends and bonuses to shareholders (if any)	
		Other payments (accounts to be specified)	
		Amount of funds on 18 , —the end of the period, as per First (or Third) Schedule ..	
£		£	

(Form referred to under heading No. 7. in Fifth Schedule.)

Summary and Valuation of the Policies of the *as at* 18 .

Description of Transactions.	Particulars of the POLICIES for Valuation.				VALUATION.			
					Value by the Interest		Table, per cent.	
	Number of policies.	Sums assured and bonuses.	Office yearly premiums.	Net yearly premiums, if ascertained.	Sums assured and bonuses.	Office yearly premiums.	Net yearly premiums, if computed.	Net liability.
ASSURANCES.								
I. *With participation in profits.*								
For whole term of life								
Other classes (to be specified) ..								
Extra premiums payable								
Total Assurances with profits ..								
II. *Without participation in profits.*								
For whole term of life								
Other classes (to be specified) ..								
Extra premiums payable								
Total Assurances without profits ..								
Total assurances								
Deduct re-assurances								
Net amount of assurances								
Adjustments, if any								
ANNUITIES.								
Immediate								
Other classes (to be specified) ..								
Total of the results								

The term "extra premium" in this Act shall be taken to mean the charge for any risk not provided for in the minimum contract premium. If policies are issued in or for any country at rates of premium deduced from tables other than the European mortality tables adopted by the company, separate schedules similar in form to the above must be furnished.

(FORM referred to under heading No. 7. in Fifth Schedule.)

Valuation Balance Sheet of *as at* 18 .

Dr.	£	*Cr.*	£
To net liability under Assurance and Annuity transactions (as per summary statement provided in Schedule 5)		By life assurance and annuity funds (as per balance sheet under Schedule 2 or 4) ..	
To surplus, if any		By deficiency, if any	

Sixth Schedule.

Statement of the Life Assurance and Annuity Business of the on the 18 .

(The answers should be numbered to accord with the numbers of the corresponding questions. Statements of re-assurances corresponding to the statements in respect of assurances, under headings 2, 3, 4, 5, and 6, are to be given.)

1. The published table or tables of premiums for assurances for the whole term of life which are in use at the date above mentioned.

2. The total amount assured on lives for the whole term of life, which are in existence at the date above mentioned, distinguishing the portions assured with and without profits, stating separately the total reversionary bonuses and specifying the sums assured for each year of life from the youngest to the oldest ages.

3. The amount of premiums receivable annually for each year of life, after deducting the abatements made by the application of bonuses, in respect of the respective assurances mentioned under heading No. 2, distinguishing ordinary from extra premiums.

4. The total amount assured under classes of assurance business, other than for the whole term of life, distinguishing the sums assured under each class, and stating separately the amount assured with and without profits, and the total amount of reversionary bonuses.

5. The amount of premiums receivable annually in respect of each such special class of assurances mentioned under heading No. 4, distinguishing ordinary from extra premiums.

6. The total amount of premiums which has been received from the commencement upon all policies under each special class mentioned under heading 4, which are in force at the date above mentioned.

7. The total amount of immediate annuities on lives, distinguishing the amounts for each year of life.

8. The amount of all annuities other than those specified under heading No. 7, distinguishing the amount of annuities payable under each class, the amount of premiums annually receivable, and the amount of consideration money received in respect of each such class, and the total amount of premiums received from the commencement upon all deferred annuities.

9. The average rate of interest at which the life assurance fund of the company was invested at the close of each year during the period since the last investigation.

10. A table of minimum values, if any, allowed for the surrender of policies for the whole term of life and for endowments and endowment assurances, or a statement of the method pursued in calculating such surrender values, with instances of its application to policies of different standing and taken out at various interval ages from the youngest to the oldest.

Separate statements to be furnished for business at other than European rates, together with a statement of the manner in which policies on unhealthy lives are dealt with.

Life Assurance Companies Act, 1871.

[34 *and* 35 *Vict., Chap.* 58. 24*th July*, 1871.]

33 & 34 Vict., c. 61.

WHEREAS by section three of the Life Assurance Companies Act, 1870, a sum of money is required in certain cases to be deposited with the Accountant General of the Court of Chancery, to be invested and returned by him in manner therein directed, and it is expedient to make further provision in respect of the deposit, investment, and return of such sum:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

Payment into court and orders as to sums deposited under 33 & 34 Vict., c. 61, s. 3.

1. Every sum required by the Life Assurance Companies Act, 1870, to be deposited with the Accountant General of the Court of Chancery shall be paid into the Court of Chancery, and orders with respect to the payment of such money into and out of court, and the investment and return thereof, and the payment of the dividends and interest thereof, may be from time to time made, altered, and revoked by the like authority and in the like manner as orders with respect to the payment into and out of court, and the investment of other money, and the application of the dividends and interest thereof.

Amendment of section 25 of 33 & 34 Vict., c. 61.

2. Section twenty-five of the Life Assurance Companies Act, 1870, shall be construed as if the words "chapter twenty-four" were and had at and from the date of the passing of such last-mentioned Act been inserted therein in place of "chapter forty-one;" and Her Majesty's Printers shall in all copies of the Life Assurance Companies Act, 1870, which may be printed after the passing of this Act, insert the words "chapter twenty-four" in the place of the words "chapter forty-one" in section twenty-five of the said Life Assurance Companies Act, 1870.

Construction and short title.

3. This Act shall be construed as one with the Life Assurance Companies Act, 1870, and that Act and this Act may be cited together as the Life Assurance Companies Acts, 1870 and 1871, and this Act may be cited as The Life Assurance Companies Act, 1871.

Life Assurance Companies Act, 1872.

[35 *and* 36 *Vict., Chap.* 41. *6th August*, 1872.]

BE it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

Deposit by Company in Court of Chancery.

1. Whereas by the provisions of the "Life Assurance Companies Acts, 1870 and 1871," a life assurance company is required to pay a sum of money into the Court of Chancery by way of deposit, and the certificate of incorporation of such company is not to be issued unless such deposit has been made, and such deposit is to be returned to the company as soon as its life assurance fund amounts to the sum therein mentioned; and doubts have arisen as to the construction of the said provisions, and it is expedient to remove such doubts; be it therefore enacted as follows:

The said deposit may be made by the subscribers of the memorandum of association of the company, or any of them, in the name of the proposed company, and such deposit upon the incorporation of the company shall be deemed to have been made by and to be part of the assets of the company.

The said deposit shall, until returned to the company, be deemed to form part of the life assurance fund of the company, and shall be subject to the provisions of section four of the Life Assurance Companies Act, 1870, accordingly. The Board of Trade may from time to time make, and when made revoke, alter, or add to, rules with respect to the payment and repayment of the said deposit, the investment of or dealing with the same, the deposit of stocks or securities in lieu of money, and the payment of the interest or dividends from time to time accruing due on any such investment, stocks, or securities in respect of such deposit. Any rules made in pursuance of this section shall have effect as if they were enacted in this Act, and shall be laid before Parliament within three weeks after they are made, if Parliament be then sitting, or, if not, within three weeks after the beginning of the then next session of Parliament.

Separation of life funds.

2. Whereas, by section four of the Life Assurance Companies Act, 1870, it is enacted that, "In the case of a "company established after the passing of this Act, "transacting other business besides that of life assurance, "a separate account shall be kept of all receipts in respect "of the life assurance and annuity contracts of the company, "and the said receipts shall be carried to and form a "separate fund, to be called the life assurance fund of the "company, and such fund shall be as absolutely the

" security of the life policy and annuity holders as though it " belonged to a company carrying on no other business " than that of life assurance, and shall not be liable for any " contracts of the company for which it would not have been " liable had the business of the company been only that of " life assurance;" and further provisions were made by the same section, with respect to the application of the above recited part of the said section to existing companies, and doubts have arisen with respect to the construction of the said provisions, and it is expedient to remove such doubts; be it therefore enacted,

That the portion of section four of the Life Assurance Companies Act, 1870, above recited shall apply to every company established before the passing of that Act, provided that the Life Assurance Companies Act, 1870, and this Act shall not diminish the liability of the life assurance fund for any contracts of the company entered into before the passing of the Life Assurance Companies Act, 1870.

Deposit of statement and abstract required by 33 & 34 Vict., c. 61, s. 10.

3. Whereas by section ten of the Life Assurance Companies Act, 1870, it is provided that, "Every annual statement " so deposited after the next investigation shall be accom- " panied by a printed copy of the abstract required to be " made by section seven," be it therefore enacted that the words "next investigation" shall be construed to mean the first investigation after the passing of the said Act.

The Board of Trade shall lay before Parliament any statement or abstract of report which is deposited with them by any company, and purports to be in pursuance of the Life Assurance Companies Act, 1870, although the Board are of opinion that it is not such a statement or abstract as is required to be prepared by that Act.

Winding up of subsidiary company to be ancillary to winding up of principal company.

4. Where the business or any part of the business of a life assurance company has, either before or after the passing of this Act, been transferred to another company under an arrangement in pursuance of which such first-mentioned company (in this Act called the subsidiary company) or the creditors thereof has or have claims against the company to which such transfer was made (in this Act called the principal company), then, if such principal company is being wound up by or under the supervision of the court, either at or after the passing of this Act, the court shall (subject as herein-after mentioned) order the subsidiary company to be wound up in conjunction with the principal company, and may by the same or any subsequent order appoint the same person to be liquidator for the two companies, and make provision for such other matters as may seem to the court necessary, with a view to such companies being wound up as if they were one company; and the commencement of the winding up of the principal company shall, save as otherwise ordered by the court, be the commencement of the winding up of the subsidiary company; the court nevertheless shall have regard, in adjusting the rights and liabilities of the members of the several companies between themselves, to the constitution of such companies, and to the arrangements entered into

between the said companies, in the same manner as the court has regard to the rights and liabilities of different classes of contributories in the case of the winding up of a single company, or as near thereto as circumstances admit.

Where any subsidiary company or company alleged to be subsidiary is not in process of being wound up at the same time as the principal company to which it is subsidiary, the court shall not direct such subsidiary company to be wound up unless after hearing all objections (if any) that may be urged by or on behalf of such company against its being wound up, the court is of opinion that such company is subsidiary to the principal company, and that the winding up of such company in conjunction with the principal company is just and equitable.

Where any subsidiary company and principal company are being wound up by different branches of the court, the court to which appeals from such branches lie shall make an order directing in which branch the winding up of such companies is to be carried on, and the necessary proceedings shall be taken for carrying such order into effect.

An application may be made in relation to the winding up of any subsidiary company in conjunction with a principal company by any creditor of, or person interested in, such principal or subsidiary company.

Where a company stands in the relation of a principal company to one company, and in the relation of a subsidiary company to some other company, or where there are several companies standing in the relation of subsidiary companies to one principal company, the court may deal with any number of such companies together or in separate groups, as it thinks most expedient, upon the principles laid down in this section.

Valuation of annuities and policies.

5. Where a life assurance company is being wound up by the court, or subject to the supervision of the court, or voluntarily, the value of every life annuity and life policy requiring to be valued in such winding up shall be estimated in manner provided by the First Schedule to this Act, but this section shall not apply to any company the winding up of which has commenced before the passing of this Act, unless the court having cognizance of the winding up so order, which order that court is hereby empowered to make, if it think it expedient so to do, on the application of any person interested in the winding up of such company.

Rules in First and Second Schedules to be rules of court.

6. The rules in the First and Second Schedules to this Act shall be of the same force as if they were rules made in pursuance of the one hundred and seventieth, one hundred and seventy-first, and one hundred and seventy-third sections of "The Companies Act, 1862," as the case may be, and may be altered in manner provided by the said sections, and rules may be made under the said sections for the purpose of carrying into effect the provisions of this Act with respect to the winding up of companies.

Regulations as to novations by policy-holders.

7. Where a company, either before or after the passing of this Act, has transferred its business to or been amalgamated with another company, no policyholder in the first-mentioned company who shall pay to the other company the

premiums accruing due in respect of his policy shall by reason of any such payment made after the passing of this Act, or by reason of any other act done after the passing of this Act, be deemed to have abandoned any claim which he would have had against the first-mentioned company on due payment of premiums to such company, or to have accepted in lieu thereof the liability of the other company, unless such abandonment and acceptance have been signified by some writing signed by him or by his agent lawfully authorised.

Construction and short title.

8. This Act shall be construed as one with the Life Assurance Companies Acts, 1870 and 1871; and those Acts and this Act may be cited together as "The Life Assurance Companies Acts, 1870 to 1872;" and this Act may be cited as "The Life Assurance Companies Act, 1872."

First Schedule.

Rule for valuing an Annuity.

An annuity shall be valued according to the tables used by the company which granted such annuity at the time of granting the same, and where such tables cannot be ascertained or adopted to the satisfaction of the court, then according to the table known as the Government Annuities Experience Table, interest being reckoned at the rate of four per centum per annum.

Rule for valuing a Policy.

The value of the policy is to be the difference between the present value of the reversion in the sum assured on the decease of the life, including any bonus or addition thereto made before the commencement of the winding up and the present value of the future annual premiums.

In calculating such present values the rate of interest is to be assumed as being four per centum per annum, and the rate of mortality as that of the tables known as the Seventeen Offices Experience Tables.

The premium to be calculated is to be such premium as according to the said rate of interest and rate of mortality is sufficient to provide for the risk incurred by the office in issuing the policy, exclusive of any addition thereto for office expenses and other charges.

Second Schedule.

Where an assurance company is being wound up by the court or subject to the supervision of the court, the official liquidator in the case of all persons appearing by the books of the company to be entitled to or interested in policies granted by such company, for life assurance, endowment, annuity, or other payment, is to ascertain the value of such policies, and give notice of such value to such persons, and any person to whom notice is so given shall be bound by the value so ascertained unless he gives notice of his intention to dispute such value in manner and within a time to be prescribed by a rule or order of the court.

Married Women's Property Act, 1870.

[33 *and* 34 *Vict., Chap.* 93. 9*th August.* 1870.]

Married woman may effect policy of insurance.

Sect. 10. A married woman may effect a policy of insurance upon her own life or the life of her husband for her separate use, and the same and all benefit thereof, if expressed on the face of it to be so effected, shall enure accordingly, and the contract in such policy shall be as valid as if made with an unmarried woman.

As to insurance of a husband for benefit of his wife.

A policy of insurance effected by any married man on his own life, and expressed upon the face of it to be for the benefit of his wife or of his wife and children, or any of them, shall enure and be deemed a trust for the benefit of his wife for her separate use, and of his children, or any of them, according to the interest so expressed, and shall not, so long as any object of the trust remains, be subject to the control of the husband or to his creditors, or form part of his estate. When the sum secured by the policy becomes payable, or at any time previously, a trustee thereof may be appointed by the Court of Chancery in England or in Ireland according as the policy of insurance was effected in England or in Ireland, or in England by the Judge of the County Court of the district, or in Ireland by the chairman of the Civil Bill Court of the division of the county in which the insurance office is situated, and the receipt of such trustee shall be a good discharge to the office. If it shall be proved that the policy was effected and premiums paid by the husband with intent to defraud his creditors, they shall be entitled to receive out of the sum secured an amount equal to the premiums so paid.

Married Women's Policies of Assurance (Scotland) Act.

[43 *and* 44 *Vict., Chap.* 26. 26*th August*, 1880.]

WHEREAS, by the Married Women's Property Act, 1870, increased facilities are given for effecting policies of assurance for the benefit of married women and children in England and Ireland:

And whereas it is expedient that such increased facilities for effecting policies of assurance for the benefit of married women and children should be extended to Scotland:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

Married woman may effect policy of assurance for her separate use.

1. A married woman may effect a policy of assurance, on her own life or on the life of her husband for her separate use; and the same and all benefit thereof, if expressed to be for her separate use, shall, immediately on being so effected, vest in her, and shall be payable to her, and her heirs, executors, and assignees, excluding the jus mariti and right of administration of her husband, and shall be assignable by her either inter vivos or mortis causa without consent of her husband; and the contract in such policy shall be as valid and effectual as if made with an unmarried woman.

Policy of assurance may be effected in trust for wife and children.

2. A policy of assurance effected by any married man on his own life, and expressed upon the face of it to be for the benefit of his wife, or of his children, or of his wife and children, shall, together with all benefit thereof, be deemed a trust for the benefit of his wife for her separate use, or for the benefit of his children, or for the benefit of his wife and children; and such policy, immediately on its being so effected, shall vest in him and his legal representatives in trust for the purpose or purposes so expressed, or in any trustee nominated in the policy, or appointed by separate writing duly intimated to the assurance office, but in trust always as aforesaid, and shall not otherwise be subject to his control, or form part of his estate, or be liable to the diligence of his creditors, or be revocable as a donation, or reducible on any ground of excess or insolvency: And the receipt of such trustee for the sums secured by the policy, or for the value thereof, in whole or in part, shall be a sufficient and effectual discharge to the assurance office: Provided always, that if it shall be proved that the policy was effected and premiums thereon paid with intent to defraud creditors, or if the person upon whose life the policy effected shall be made bankrupt within two years from the date of such policy, it shall be competent to the creditors to claim repayment of the premiums so paid from the trustee of the policy out of the proceeds thereof.

Application and short title of Act.

3. This Act shall apply only to Scotland, and may be cited as the Married Women's Policies of Assurance (Scotland) Act, 1880.

Married Women's Property Act, 1882.

[45 *and* 46 *Vict., Chap.* 75. 18*th August*, 1882.]

Moneys payable under policy of assurance not to form part of estate of the insured.

Sect. 11. A married woman may by virtue of the power of making contracts herein-before contained effect a policy upon her own life or the life of her husband for her separate use; and the same and all benefit thereof shall enure accordingly.

A policy of assurance effected by any man on his own life, and expressed to be for the benefit of his wife or of his children, or of his wife and children, or any of them, or by any woman on her own life, and expressed to be for the benefit of her husband, or of her children, or of her husband and children, or any of them, shall create a trust in favour of the objects therein named, and the moneys payable under any such policy shall not, so long as any object of the trust remains unperformed, form part of the estate of the insured, or be subject to his or her debts: Provided, that if it shall be proved that the policy was effected and the premiums paid with intent to defraud the creditors of the insured, they shall be entitled to receive, out of the moneys payable under the policy, a sum equal to the premiums so paid. The insured may by the policy, or by any memorandum under his or her hand, appoint a trustee or trustees of the moneys payable under the policy, and from time to time appoint a new trustee or new trustees thereof, and may make provision for the appointment of a new trustee or new trustees thereof, and for the investment of the moneys payable under any such policy. In default of any such appointment of a trustee, such policy, immediately on its being effected, shall vest in the insured and his or her legal personal representatives, in trust for the purposes aforesaid. If, at the time of the death of the insured, or at any time afterwards, there shall be no trustee, or it shall be expedient to appoint a new trustee or new trustees, a trustee or trustees or a new trustee or new trustees may be appointed by any court having jurisdiction under the provisions of the Trustee Act, 1850, or the Acts amending and extending the same. The receipt of a trustee or trustees duly appointed, or, in default of any such appointment, or in default of notice to the insurance office, the receipt of the legal personal representative of the insured shall be a discharge to the office for the sum secured by the policy, or for the value thereof, in whole or in part.

13 & 14 Vict. c. 60.

APPENDIX C.

TABLES.

I. The Amount of 1 accumulated at Compound Interest at the end of any given number of years.

Rates of Interest—2, 2½, 3, 4, 5, and 6 per cent.

II. The Present Value of 1 to be received at the end of any given number of years.

Rates of Interest—2, 2½, 3, 4, 5, and 6 per cent.

III. The Amount of an Annuity of 1 payable in advance at the end of any given number of years.

Rates of Interest—2, 2½, 3, 4, 5, and 6 per cent.

IV. The Present Value of an Annuity of 1 payable during any given number of years.

Rates of Interest—2, 2½, 3, 4, 5, and 6 per cent.

V. The Present Value by the H^M Table of an Annuity of £1 payable during the continuance of the life of a person of a given age.

The Single and Annual Premiums by the H^M Table, for an Assurance of £100, payable on the death of a person of a given age.

The Annual Premium by the H^M Select Table for an Assurance of £100, payable on the death of a person of a given age.

Rates of Interest—3, 3½, and 4 per cent.

VI. The Expectation of Life at Quinquennial Ages according to various Mortality Tables.

Table I.

The Amount of 1 *for any Number of Years.*

Years.	2 per Cent.	2½ per Cent.	3 per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	Years.
1	1·0200	1·0250	1·0300	1·0400	1·0500	1·0600	1
2	1·0404	1·0506	1·0609	1·0816	1·1025	1·1236	2
3	1·0612	1·0769	1·0927	1·1249	1·1576	1·1910	3
4	1·0824	1·1038	1·1255	1·1699	1·2155	1·2625	4
5	1·1041	1·1314	1·1593	1·2167	1·2763	1·3382	5
6	1·1262	1·1597	1·1941	1·2653	1·3401	1·4185	6
7	1·1487	1·1887	1·2299	1·3159	1·4071	1·5036	7
8	1·1717	1·2184	1·2668	1·3686	1·4775	1·5938	8
9	1·1951	1·2489	1·3048	1·4233	1·5513	1·6895	9
10	1·2190	1·2801	1·3439	1·4802	1·6289	1·7908	10
11	1·2434	1·3121	1·3842	1·5395	1·7103	1·8983	11
12	1·2682	1·3449	1·4258	1·6010	1·7959	2·0122	12
13	1·2936	1·3785	1·4685	1·6651	1·8856	2·1329	13
14	1·3195	1·4130	1·5126	1·7317	1·9799	2·2609	14
15	1·3459	1·4483	1·5580	1·8009	2·0789	2·3966	15
16	1·3728	1·4845	1·6047	1·8730	2·1829	2·5404	16
17	1·4002	1·5216	1·6528	1·9479	2·2920	2·6928	17
18	1·4282	1·5597	1·7024	2·0258	2·4066	2·8543	18
19	1·4568	1·5987	1·7535	2·1068	2·5270	3·0256	19
20	1·4859	1·6386	1·8061	2·1911	2·6533	3·2071	20
21	1·5157	1·6796	1·8603	2·2788	2·7860	3·3996	21
22	1·5460	1·7216	1·9161	2·3699	2·9253	3·6035	22
23	1·5769	1·7646	1·9736	2·4647	3·0715	3·8197	23
24	1·6084	1·8087	2·0328	2·5633	3·2251	4·0489	24
25	1·6406	1·8539	2·0938	2·6658	3·3864	4·2919	25
26	1·6734	1·9003	2·1566	2·7725	3·5557	4·5494	26
27	1·7069	1·9478	2·2213	2·8834	3·7335	4·8223	27
28	1·7410	1·9965	2·2879	2·9987	3·9202	5·1117	28
29	1·7758	2·0464	2·3566	3·1187	4·1162	5·4184	29
30	1·8114	2·0976	2·4273	3·2434	4·3219	5·7435	30
31	1·8476	2·1500	2·5001	3·3731	4·5380	6·0881	31
32	1·8845	2·2038	2·5751	3·5081	4·7649	6·4534	32
33	1·9222	2·2589	2·6523	3·6484	5·0032	6·8406	33
34	1·9607	2·3153	2·7319	3·7943	5·2533	7·2511	34
35	1·9999	2·3732	2·8139	3·9461	5·5160	7·6861	35
36	2·0399	2·4325	2·8983	4·1039	5·7918	8·1473	36
37	2·0807	2·4933	2·9852	4·2681	6·0814	8·6361	37
38	2·1223	2·5557	3·0748	4·4388	6·3855	9·1543	38
39	2·1647	2·6196	3·1670	4·6164	6·7048	9·7035	39
40	2·2080	2·6851	3·2620	4·8010	7·0400	10·2857	40
41	2·2522	2·7522	3·3599	4·9931	7·3920	10·9029	41
42	2·2972	2·8210	3·4607	5·1928	7·7616	11·5570	42
43	2·3432	2·8915	3·5645	5·4005	8·1497	12·2505	43
44	2·3901	2·9638	3·6715	5·6165	8·5572	12·9855	44
45	2·4379	3·0379	3·7816	5·8411	8·9850	13·7646	45
46	2·4866	3·1139	3·8950	6·0748	9·4343	14·5905	46
47	2·5363	3·1917	4·0119	6·3178	9·9060	15·4659	47
48	2·5871	3·2715	4·1323	6·5705	10·4013	16·3939	48
49	2·6388	3·3533	4·2562	6·8333	10·9213	17·3775	49
50	2·6916	3·4371	4·3839	7·1067	11·4674	18·4202	50

TABLE I.—(*Continued.*)

The Amount of 1 *for any Number of Years.*

Years.	2 per Cent.	2½ per Cent.	3 per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	Years.
51	2·7454	3·5230	4·5154	7·3910	12·0408	19·5254	51
52	2·8003	3·6111	4·6509	7·6866	12·6428	20·6969	52
53	2·8563	3·7014	4·7904	7·9941	13·2749	21·9387	53
54	2·9135	3·7939	4·9341	8·3138	13·9387	23·2550	54
55	2·9717	3·8888	5·0821	8·6464	14·6356	24·6503	55
56	3·0312	3·9860	5·2346	8·9922	15·3674	26·1293	56
57	3·0918	4·0856	5·3917	9·3519	16·1358	27·6971	57
58	3·1536	4·1878	5·5534	9·7260	16·9426	29·3589	58
59	3·2167	4·2925	5·7200	10·1150	17·7897	31·1205	59
60	3·2810	4·3998	5·8916	10·5196	18·6792	32·9877	60
61	3·3467	4·5098	6·0684	10·9404	19·6131	34·9670	61
62	3·4136	4·6225	6·2504	11·3780	20·5938	37·0650	62
63	3·4819	4·7381	6·4379	11·8322	21·6235	39·2889	63
64	3·5515	4·8565	6·6311	12·3065	22·7047	41·6462	64
65	3·6225	4·9780	6·8300	12·7987	23·8399	44·1450	65
66	3·6950	5·1024	7·0349	13·3107	25·0319	46·7937	66
67	3·7689	5·2300	7·2460	13·8431	26·2835	49·6013	67
68	3·8443	5·3607	7·4633	14·3968	27·5977	52·5774	68
69	3·9211	5·4947	7·6872	14·9727	28·9775	55·7320	69
70	3·9996	5·6321	7·9178	15·5716	30·4264	59·0759	70
71	4·0795	5·7729	8·1554	16·1945	31·9477	62·6205	71
72	4·1611	5·9172	8·4000	16·8423	33·5451	66·3777	72
73	4·2444	6·0652	8·6520	17·5160	35·2224	70·3604	73
74	4·3293	6·2168	8·9116	18·2166	36·9835	74·5820	74
75	4·4158	6·3722	9·1789	18·9453	38·8327	79·0569	75
76	4·5042	6·5315	9·4543	19·7031	40·7743	83·8003	76
77	4·5942	6·6948	9·7379	20·4912	42·8130	88·8284	77
78	4·6861	6·8622	10·0301	21·3108	44·9537	94·1581	78
79	4·7798	7·0337	10·3310	22·1633	47·2014	99·8075	79
80	4·8754	7·2096	10·6409	23·0498	49·5614	105·7960	80
81	4·9729	7·3898	10·9601	23·9718	52·0395	112·1438	81
82	5·0724	7·5746	11·2889	24·9307	54·6415	118·8724	82
83	5·1739	7·7639	11·6276	25·9279	57·3736	126·0047	83
84	5·2773	7·9580	11·9764	26·9650	60·2422	133·5650	84
85	5·3829	8·1570	12·3357	28·0436	63·2544	141·5789	85
86	5·4905	8·3609	12·7058	29·1653	66·4171	150·0736	86
87	5·6003	8·5699	13·0870	30·3320	69·7379	159·0781	87
88	5·7123	8·7842	13·4796	31·5452	73·2248	168·6227	88
89	5·8266	9·0038	13·8839	32·8071	76·8861	178·7401	89
90	5·9431	9·2289	14·3005	34·1193	80·7304	189·4645	90
91	6·0620	9·4596	14·7295	35·4841	84·7669	200·8324	91
92	6·1832	9·6961	15·1714	36·9035	89·0052	212·8823	92
93	6·3069	9·9385	15·6265	38·3796	93·4555	225·6553	93
94	6·4330	10·1869	16·0953	39·9148	98·1283	239·1946	94
95	6·5617	10·4416	16·5782	41·5114	103·0347	253·5463	95
96	6·6929	10·7026	17·0755	43·1718	108·1864	268·7590	96
97	6·8268	10·9702	17·5878	44·8987	113·5957	284·8846	97
98	6·9633	11·2445	18·1154	46·6947	119·2755	301·9776	98
99	7·1026	11·5256	18·6589	48·5625	125·2393	320·0963	99
100	7·2446	11·8137	19·2186	50·5049	131·5013	339·3021	100

Table II.

The Present Value of 1 *due at the End of any Number of Years.*

Years.	2 per Cent.	2½ per Cent.	3 per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	Years.
1	·9804	·9756	·9709	·9615	·9524	·9434	1
2	·9612	·9518	·9426	·9246	·9070	·8900	2
3	·9423	·9286	·9151	·8890	·8638	·8396	3
4	·9238	·9060	·8885	·8548	·8227	·7921	4
5	·9057	·8839	·8626	·8219	·7835	·7473	5
6	·8880	·8623	·8375	·7903	·7462	·7050	6
7	·8706	·8413	·8131	·7599	·7107	·6651	7
8	·8535	·8207	·7894	·7307	·6768	·6274	8
9	·8368	·8007	·7664	·7026	·6446	·5919	9
10	·8203	·7812	·7441	·6756	·6139	·5584	10
11	·8043	·7621	·7224	·6496	·5847	·5268	11
12	·7885	·7436	·7014	·6246	·5568	·4970	12
13	·7730	·7254	·6810	·6006	·5303	·4688	13
14	·7579	·7077	·6611	·5775	·5051	·4423	14
15	·7430	·6905	·6419	·5553	·4810	·4173	15
16	·7284	·6736	·6232	·5339	·4581	·3936	16
17	·7142	·6572	·6050	·5134	·4363	·3714	17
18	·7002	·6412	·5874	·4936	·4155	·3503	18
19	·6864	·6255	·5703	·4746	·3957	·3305	19
20	·6730	·6103	·5537	·4564	·3769	·3118	20
21	·6598	·5954	·5375	·4388	·3589	·2942	21
22	·6468	·5809	·5219	·4220	·3418	·2775	22
23	·6342	·5667	·5067	·4057	·3256	·2618	23
24	·6217	·5529	·4919	·3901	·3101	·2470	24
25	·6095	·5394	·4776	·3751	·2953	·2330	25
26	·5976	·5262	·4637	·3607	·2812	·2198	26
27	·5859	·5134	·4502	·3468	·2678	·2074	27
28	·5744	·5009	·4371	·3335	·2551	·1956	28
29	·5631	·4887	·4243	·3207	·2429	·1846	29
30	·5521	·4767	·4120	·3083	·2314	·1741	30
31	·5412	·4651	·4000	·2965	·2204	·1643	31
32	·5306	·4538	·3883	·2851	·2099	·1550	32
33	·5202	·4427	·3770	·2741	·1999	·1462	33
34	·5100	·4319	·3660	·2636	·1904	·1379	34
35	·5000	·4214	·3554	·2534	·1813	·1301	35
36	·4902	·4111	·3450	·2437	·1727	·1227	36
37	·4806	·4011	·3350	·2343	·1644	·1158	37
38	·4712	·3913	·3252	·2253	·1566	·1092	38
39	·4619	·3817	·3158	·2166	·1491	·1031	39
40	·4529	·3724	·3066	·2083	·1420	·0972	40
41	·4440	·3633	·2976	·2003	·1353	·0917	41
42	·4353	·3545	·2890	·1926	·1288	·0865	42
43	·4268	·3458	·2805	·1852	·1227	·0816	43
44	·4184	·3374	·2724	·1780	·1169	·0770	44
45	·4102	·3292	·2644	·1712	·1113	·0727	45
46	·4022	·3211	·2567	·1646	·1060	·0685	46
47	·3943	·3133	·2493	·1583	·1009	·0647	47
48	·3865	·3057	·2420	·1522	·0961	·0610	48
49	·3790	·2982	·2350	·1463	·0916	·0575	49
50	·3715	·2909	·2281	·1407	·0872	·0543	50

TABLE II.—(*Continued.*)

The Present Value of 1 *due at the End of any Number of Years.*

Years.	2 per Cent.	2½ per Cent.	3 per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	Years.
51	·3642	·2838	·2215	·1353	·0831	·0512	51
52	·3571	·2769	·2150	·1301	·0791	·0483	52
53	·3501	·2702	·2088	·1251	·0753	·0456	53
54	·3432	·2636	·2027	·1203	·0717	·0430	54
55	·3365	·2572	·1968	·1157	·0683	·0406	55
56	·3299	·2509	·1910	·1112	·0651	·0383	56
57	·3234	·2448	·1855	·1069	·0620	·0361	57
58	·3171	·2388	·1801	·1028	·0590	·0341	58
59	·3109	·2330	·1748	·0989	·0562	·0321	59
60	·3048	·2273	·1697	·0951	·0535	·0303	60
61	·2988	·2217	·1648	·0914	·0510	·0286	61
62	·2929	·2163	·1600	·0879	·0486	·0270	62
63	·2872	·2111	·1553	·0845	·0462	·0255	63
64	·2816	·2059	·1508	·0813	·0440	·0240	64
65	·2761	·2009	·1464	·0781	·0419	·0227	65
66	·2706	·1960	·1421	·0751	·0399	·0214	66
67	·2653	·1912	·1380	·0722	·0380	·0202	67
68	·2601	·1865	·1340	·0695	·0362	·0190	68
69	·2550	·1820	·1301	·0668	·0345	·0179	69
70	·2500	·1776	·1263	·0642	·0329	·0169	70
71	·2451	·1732	·1226	·0617	·0313	·0160	71
72	·2403	·1690	·1190	·0594	·0298	·0151	72
73	·2356	·1649	·1156	·0571	·0284	·0142	73
74	·2310	·1609	·1122	·0549	·0270	·0134	74
75	·2265	·1569	·1089	·0528	·0258	·0126	75
76	·2220	·1531	·1058	·0508	·0245	·0119	76
77	·2177	·1494	·1027	·0488	·0234	·0113	77
78	·2134	·1457	·0997	·0469	·0222	·0106	78
79	·2092	·1422	·0968	·0451	·0212	·0100	79
80	·2051	·1387	·0940	·0434	·0202	·0095	80
81	·2011	·1353	·0912	·0417	·0192	·0089	81
82	·1971	·1320	·0886	·0401	·0183	·0084	82
83	·1933	·1288	·0860	·0386	·0174	·0079	83
84	·1895	·1257	·0835	·0371	·0166	·0075	84
85	·1858	·1226	·0811	·0357	·0158	·0071	85
86	·1821	·1196	·0787	·0343	·0151	·0067	86
87	·1786	·1167	·0764	·0330	·0143	·0063	87
88	·1751	·1138	·0742	·0317	·0137	·0059	88
89	·1716	·1111	·0720	·0305	·0130	·0056	89
90	·1683	·1084	·0699	·0293	·0124	·0053	90
91	·1650	·1057	·0679	·0282	·0118	·0050	91
92	·1617	·1031	·0659	·0271	·0112	·0047	92
93	·1586	·1006	·0640	·0261	·0107	·0044	93
94	·1554	·0982	·0621	·0251	·0102	·0042	94
95	·1524	·0958	·0603	·0241	·0097	·0039	95
96	·1494	·0934	·0586	·0232	·0092	·0037	96
97	·1465	·0912	·0569	·0223	·0088	·0035	97
98	·1436	·0889	·0552	·0214	·0084	·0033	98
99	·1408	·0868	·0536	·0206	·0080	·0031	99
100	·1380	·0846	·0520	·0198	·0076	·0029	100

TABLE III.

The Amount of 1 *per Annum payable in advance for any Number of Years.*

Years.	2 per Cent.	2½ per Cent.	3 per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	Years.
1	1·0200	1·0250	1·0300	1·0400	1·0500	1·0600	1
2	2·0604	2·0756	2·0909	2·1216	2·1525	2·1836	2
3	3·1216	3·1525	3·1836	3·2465	3·3101	3·3746	3
4	4·2040	4·2563	4·3091	4·4163	4·5256	4·6371	4
5	5·3081	5·3877	5·4684	5·6330	5·8019	5·9753	5
6	6·4343	6·5474	6·6625	6·8983	7·1420	7·3938	6
7	7·5830	7·7361	7·8923	8·2142	8·5491	8·8975	7
8	8·7546	8·9545	9·1591	9·5828	10·0266	10·4913	8
9	9·9497	10·2034	10·4639	11·0061	11·5779	12·1808	9
10	11·1687	11·4835	11·8078	12·4864	13·2068	13·9716	10
11	12·4121	12·7956	13·1920	14·0258	14·9171	15·8699	11
12	13·6803	14·1404	14·6178	15·6268	16·7129	17·8821	12
13	14·9739	15·5190	16·0863	17·2919	18·5986	20·0151	13
14	16·2934	16·9319	17·5989	19·0236	20·5786	22·2760	14
15	17·6393	18·3802	19·1569	20·8245	22·6575	24·6725	15
16	19·0121	19·8647	20·7616	22·6975	24·8404	27·2129	16
17	20·4123	21·3863	22·4144	24·6454	27·1324	29·9057	17
18	21·8406	22·9460	24·1169	26·6712	29·5390	32·7600	18
19	23·2974	24·5447	25·8704	28·7781	32·0660	35·7856	19
20	24·7833	26·1833	27·6765	30·9692	34·7193	38·9927	20
21	26·2990	27·8629	29·5368	33·2480	37·5052	42·3923	21
22	27·8450	29·5844	31·4529	35·6179	40·4305	45·9958	22
23	29·4219	31·3490	33·4265	38·0826	43·5020	49·8156	23
24	31·0303	33·1578	35·4593	40·6459	46·7271	53·8645	24
25	32·6709	35·0117	37·5530	43·3117	50·1135	58·1564	25
26	34·3443	36·9120	39·7096	46·0842	53·6691	62·7058	26
27	36·0512	38·8598	41·9309	48·9676	57·4026	67·5281	27
28	37·7922	40·8563	44·2189	51·9663	61·3227	72·6398	28
29	39·5681	42·9027	46·5754	55·0849	65·4388	78·0582	29
30	41·3794	45·0003	49·0027	58·3283	69·7608	83·8017	30
31	43·2270	47·1503	51·5028	61·7015	74·2988	89·8898	31
32	45·1116	49·3540	54·0778	65·2095	79·0638	96·3432	32
33	47·0338	51·6129	56·7302	68·8579	84·0670	103·1838	33
34	48·9945	53·9282	59·4621	72·6522	89·3203	110·4348	34
35	50·9944	56·3014	62·2759	76·5983	94·8363	118·1209	35
36	53·0343	58·7339	65·1742	80·7022	100·6281	126·2681	36
37	55·1149	61·2273	68·1594	84·9703	106·7095	134·9042	37
38	57·2372	63·7830	71·2342	89·4092	113·0950	144·0585	38
39	59·4020	66·4026	74·4013	94·0255	119·7998	153·7620	39
40	61·6100	69·0876	77·6633	98·8265	126·8398	164·0477	40
41	63·8622	71·8398	81·0232	103·8196	134·2318	174·9505	41
42	66·1595	74·6608	84·4839	109·0124	141·9933	186·5076	42
43	68·5027	77·5523	88·0484	114·4129	150·1430	198·7580	43
44	70·8927	80·5161	91·7199	120·0294	158·7002	211·7435	44
45	73·3306	83·5540	95·5015	125·8706	167·6852	225·5081	45
46	75·8172	86·6679	99·3965	131·9454	177·1194	240·0986	46
47	78·3535	89·8596	103·4084	138·2632	187·0254	255·5645	47
48	80·9406	93·1311	107·5406	144·8337	197·4267	271·9584	48
49	83·5794	96·4843	111·7969	151·6671	208·3480	289·3359	49
50	86·2710	99·9215	116·1808	158·7738	219·8154	307·7561	50

TABLE III.—(*Continued.*)

The Amount of 1 *per Annum payable in advance for any Number of Years.*

Years.	2 per Cent.	2½ per Cent.	3 per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	Years.
51	89·0164	103·4445	120·6962	166·1647	231·8562	327·2814	51
52	91·8167	107·0556	125·3471	173·8513	244·4990	347·9783	52
53	94·6731	110·7570	130·1375	181·8454	257·7739	369·9170	53
54	97·5865	114·5509	135·0716	190·1592	271·7126	393·1720	54
55	100·5583	118·4397	140·1538	198·8055	286·3482	417·8223	55
56	103·5894	122·4257	145·3884	207·7978	301·7157	443·9517	56
57	106·6812	126·5113	150·7800	217·1497	317·8514	471·6488	57
58	109·8348	130·6991	156·3334	226·8757	334·7940	501·0077	58
59	113·0515	134·9916	162·0534	236·9907	352·5837	532·1282	59
60	116·3326	139·3914	167·9450	247·5103	371·2629	565·1159	60
61	119·6792	143·9012	174·0134	258·4507	390·8760	600·0828	61
62	123·0928	148·5237	180·2638	269·8288	411·4699	637·1478	62
63	126·5747	153·2618	186·7017	281·6619	433·0933	676·4367	63
64	130·1262	158·1183	193·3328	293·9684	455·7980	718·0829	64
65	133·7487	163·0963	200·1627	306·7671	479·6379	762·2278	65
66	137·4437	168·1987	207·1976	320·0778	504·6698	809·0215	66
67	141·2125	173·4287	214·4436	333·9209	530·9532	858·6228	67
68	145·0568	178·7894	221·9069	348·3177	558·5510	911·2002	68
69	148·9779	184·2841	229·5941	363·2905	587·5285	966·9322	69
70	152·9775	189·9162	237·5119	378·8621	617·9549	1026·0081	70
71	157·0570	195·6891	245·6672	395·0566	649·9027	1088·6286	71
72	161·2182	201·6064	254·0673	411·8988	683·4478	1155·0063	72
73	165·4625	207·6715	262·7193	429·4148	718·6702	1225·3667	73
74	169·7918	213·8883	271·6309	447·6314	755·6537	1299·9487	74
75	174·2076	220·2605	280·8098	466·5766	794·4864	1379·0056	75
76	178·7118	226·7920	290·2641	486·2797	835·2607	1462·8059	76
77	183·3060	233·4868	300·0020	506·7709	878·0738	1551·6343	77
78	187·9921	240·3490	310·0321	528·0817	923·0274	1645·7924	78
79	192·7720	247·3827	320·3630	550·2450	970·2288	1745·5999	79
80	197·6474	254·5923	331·0039	573·2948	1019·7903	1851·3959	80
81	202·6203	261·9821	341·9640	597·2666	1071·8298	1963·5396	81
82	207·6928	269·5566	353·2529	622·1972	1126·4713	2082·4120	82
83	212·8666	277·3206	364·8805	648·1251	1183·8448	2208·4167	83
84	218·1439	285·2786	376·8570	676·0901	1244·0871	2341·9817	84
85	223·5268	293·4355	389·1927	703·1337	1307·3414	2483·5606	85
86	229·0174	301·7964	401·8984	732·2991	1373·7585	2633·6343	86
87	234·6177	310·3663	414·9854	762·6310	1443·4964	2792·7123	87
88	240·3301	319·1505	428·4650	794·1763	1516·7212	2961·3351	88
89	246·1567	328·1543	442·3489	826·9833	1593·6073	3140·0752	89
90	252·0998	338·3831	456·6494	861·1027	1674·3377	3329·5397	90
91	258·1618	346·8427	471·3789	896·5868	1759·1045	3530·3721	91
92	264·3450	356·5388	486·5502	933·4902	1848·1098	3743·2544	92
93	270·6519	366·4772	502·1767	971·8699	1941·5653	3968·9097	93
94	277·0850	376·6642	518·2720	1011·7846	2039·6935	4208·1043	94
95	283·6467	387·1058	534·8502	1053·2960	2142·7282	4461·6505	95
96	290·3396	397·8084	551·9257	1096·4679	2250·9146	4730·4095	96
97	297·1664	408·7786	569·5135	1141·3666	2364·5103	5015·2941	97
98	304·1297	420·0231	587·6289	1188·0613	2483·7859	5317·2718	98
99	311·2323	431·5487	606·2877	1236·6237	2609·0252	5637·3681	99
100	318·4769	443·3624	625·5063	1287·1286	2740·5265	5976·6702	100

Table IV.

The Present Value of 1 *per Annum for any Number of Years.*

Years.	2 per Cent.	2½ per Cent.	3 per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	Years.
1	·9804	·9756	·9709	·9615	·9524	·9434	1
2	1·9416	1·9274	1·9135	1·8861	1·8594	1·8334	2
3	2·8839	2·8560	2·8216	2·7751	2·7232	2·6730	3
4	3·8077	3·7620	3·7171	3·6299	3·5460	3·4651	4
5	4·7135	4·6458	4·5797	4·4518	4·3295	4·2124	5
6	5·6014	5·5081	5·4172	5·2421	5·0757	4·9173	6
7	6·4720	6·3494	6·2303	6·0021	5·7864	5·5824	7
8	7·3255	7·1701	7·0197	6·7327	6·4632	6·2098	8
9	8·1622	7·9709	7·7861	7·4353	7·1078	6·8017	9
10	8·9826	8·7521	8·5302	8·1109	7·7217	7·3601	10
11	9·7868	9·5142	9·2526	8·7605	8·3064	7·8869	11
12	10·5753	10·2578	9·9540	9·3851	8·8633	8·3838	12
13	11·3484	10·9832	10·6350	9·9856	9·3936	8·8527	13
14	12·1062	11·6909	11·2961	10·5631	9·8986	9·2950	14
15	12·8493	12·3814	11·9379	11·1184	10·3797	9·7122	15
16	13·5777	13·0550	12·5611	11·6523	10·8378	10·1059	16
17	14·2919	13·7122	13·1661	12·1657	11·2741	10·4773	17
18	14·9920	14·3534	13·7535	12·6593	11·6896	10·8276	18
19	15·6785	14·9789	14·3238	13·1339	12·0853	11·1581	19
20	16·3514	15·5892	14·8775	13·5903	12·4622	11·4699	20
21	17·0112	16·1845	15·4150	14·0292	12·8212	11·7641	21
22	17·6580	16·7654	15·9369	14·4511	13·1630	12·0416	22
23	18·2922	17·3321	16·4436	14·8568	13·4886	12·3034	23
24	18·9139	17·8850	16·9355	15·2470	13·7986	12·5504	24
25	19·5235	18·4244	17·4131	15·6221	14·0939	12·7834	25
26	20·1210	18·9506	17·8768	15·9828	14·3752	13·0032	26
27	20·7069	19·4640	18·3270	16·3296	14·6430	13·2105	27
28	21·2813	19·9649	18·7641	16·6631	14·8981	13·4062	28
29	21·8444	20·4536	19·1885	16·9837	15·1411	13·5907	29
30	22·3965	20·9303	19·6004	17·2920	15·3725	13·7648	30
31	22·9377	21·3954	20·0004	17·5885	15·5928	13·9291	31
32	23·4683	21·8492	20·3888	17·8736	15·8027	14·0840	32
33	23·9886	22·2919	20·7658	18·1476	16·0025	14·2302	33
34	24·4986	22·7238	21·1318	18·4112	16·1929	14·3681	34
35	24·9986	23·1452	21·4872	18·6646	16·3742	14·4982	35
36	25·4888	23·5563	21·8323	18·9083	16·5469	14·6210	36
37	25·9695	23·9573	22·1672	19·1426	16·7113	14·7368	37
38	26·4406	24·3486	22·4925	19·3679	16·8679	14·8460	38
39	26·9026	24·7303	22·8082	19·5845	17·0170	14·9491	39
40	27·3555	25·1028	23·1148	19·7928	17·1591	15·0463	40
41	27·7995	25·4661	23·4124	19·9931	17·2944	15·1380	41
42	28·2348	25·8206	23·7014	20·1856	17·4232	15·2245	42
43	28·6616	26·1664	23·9819	20·3708	17·5459	15·3062	43
44	29·0800	26·5038	24·2543	20·5488	17·6628	15·3832	44
45	29·4902	26·8330	24·5187	20·7200	17·7741	15·4558	45
46	29·8923	27·1542	24·7754	20·8847	17·8801	15·5244	46
47	30·2866	27·4675	25·0247	21·0429	17·9810	15·5890	47
48	30·6731	27·7732	25·2667	21·1951	18·0772	15·6500	48
49	31·0521	28·0714	25·5017	21·3415	18·1687	15·7076	49
50	31·4236	28·3623	25·7298	21·4822	18·2559	15·7619	50

TABLE IV.—(*Continued.*)

The Present Value of 1 *per Annum for any Number of Years.*

Years.	2 per Cent.	2½ per Cent.	3 per Cent.	4 per Cent.	5 per Cent.	6 per Cent.	Years.
51	31·7878	28·6462	25·9512	21·6175	18·3390	15·8131	51
52	32·1450	28·9231	26·1662	21·7476	18·4181	15·8614	52
53	32·4950	29·1932	26·3750	21·8727	18·4934	15·9070	53
54	32·8383	29·4568	26·5777	21·9930	18·5651	15·9500	54
55	33·1748	29·7140	26·7744	22·1086	18·6335	15·9905	55
56	33·5047	29·9649	26·9655	22·2198	18·6985	16·0288	56
57	33·8281	30·2096	27·1509	22·3267	18·7605	16·0649	57
58	34·1452	30·4484	27·3310	22·4296	18·8195	16·0990	58
59	34·4561	30·6814	27·5058	22·5284	18·8758	16·1311	59
60	34·7609	30·9087	27·6756	22·6235	18·9293	16·1614	60
61	35·0597	31·1304	27·8404	22·7149	18·9803	16·1900	61
62	35·3526	31·3467	28·0003	22·8028	19·0288	16·2170	62
63	35·6398	31·5578	28·1557	22·8873	19·0751	16·2425	63
64	35·9214	31·7637	28·3065	22·9685	19·1191	16·2665	64
65	36·1975	31·9646	28·4529	23·0467	19·1611	16·2891	65
66	36·4681	32·1606	28·5950	23·1218	19·2010	16·3105	66
67	36·7334	32·3518	28·7330	23·1940	19·2391	16·3307	67
68	36·9936	32·5383	28·8670	23·2635	19·2753	16·3497	68
69	37·2486	32·7203	28·9971	23·3303	19·3098	16·3676	69
70	37·4986	32·8979	29·1234	23·3945	19·3427	16·3845	70
71	37·7437	33·0711	29·2460	23·4563	19·3740	16·4005	71
72	37·9841	33·2401	29·3651	23·5156	19·4038	16·4156	72
73	38·2197	33·4050	29·4807	23·5727	19·4322	16·4298	73
74	38·4507	33·5658	29·5929	23·6276	19·4592	16·4432	74
75	38·6771	33·7227	29·7018	23·6804	19·4850	16·4558	75
76	38·8991	33·8758	29·8076	23·7312	19·5095	16·4678	76
77	39·1168	34·0252	29·9103	23·7800	19·5329	16·4790	77
78	39·3302	34·1709	30·0100	23·8269	19·5551	16·4897	78
79	39·5394	34·3131	30·1068	23·8720	19·5763	16·4997	79
80	39·7445	34·4518	30·2008	23·9154	19·5965	16·5091	80
81	39·9456	34·5871	30·2920	23·9571	19·6157	16·5180	81
82	40·1427	34·7192	30·3806	23·9972	19·6340	16·5265	82
83	40·3360	34·8480	30·4666	24·0358	19·6514	16·5344	83
84	40·5255	34·9736	30·5501	24·0729	19·6680	16·5419	84
85	40·7113	35·0962	30·6312	24·1085	19·6838	16·5489	85
86	40·8934	35·2158	30·7099	24·1428	19·6989	16·5556	86
87	41·0720	35·3325	30·7863	24·1758	19·7132	16·5619	87
88	41·2470	35·4463	30·8605	24·2075	19·7269	16·5678	88
89	41·4187	35·5574	30·9325	24·2380	19·7399	16·5734	89
90	41·5869	35·6658	31·0024	24·2673	19·7523	16·5787	90
91	41·7519	35·7715	31·0703	24·2955	19·7641	16·5837	91
92	41·9136	35·8746	31·1362	24·3226	19·7753	16·5884	92
93	42·0722	35·9752	31·2002	24·3486	19·7860	16·5928	93
94	42·2276	36·0734	31·2623	24·3737	19·7962	16·5970	94
95	42·3800	36·1692	31·3227	24·3978	19·8059	16·6009	95
96	42·5294	36·2626	31·3812	24·4209	19·8151	16·6047	96
97	42·6759	36·3538	31·4381	24·4432	19·8239	16·6082	97
98	42·8195	36·4427	31·4933	24·4646	19·8323	16·6115	98
99	42·9603	36·5295	31·5469	24·4852	19·8403	16·6146	99
100	43·0984	36·6141	31·5989	24·5050	19·8479	16·6175	100
Perpetuity.	50·0000	40·0000	33·3333	25·0000	20·0000	16·6667	Perpetuity.

TABLE V.—H^{M} 3 *per Cent.*

Age next Birthday.	Value of an Annuity of £1.	Single Premium for an Assurance of £100.	Annual Premium for an Assurance of £100.		Age next Birthday.
			Aggregate Table.	Select Table.	
	£	£	£	£	
20	22·043	32·886	1·427	1·563	20
21	21·848	33·451	1·464	1·586	21
22	21·656	34·011	1·501	1·611	22
23	21·460	34·584	1·540	1·638	23
24	21·254	35·183	1·581	1·669	24
25	21·038	35·812	1·625	1·703	24
26	20·814	36·465	1·672	1·740	26
27	20·582	37·139	1·721	1·781	27
28	20·347	37·824	1·772	1·826	28
29	20·109	38·518	1·825	1·874	29
30	19·867	39·221	1·880	1·925	30
31	19·623	39·934	1·936	1·980	31
32	19·373	40·662	1·996	2·035	32
33	19·117	41·407	2·058	2·093	33
34	18·855	42·170	2·124	2·154	34
35	18·587	42·950	2·193	2·218	35
36	18·314	43·745	2·265	2·286	36
37	18·037	44·553	2·340	2·358	37
38	17·756	45·372	2·419	2·435	38
39	17·469	46·207	2·502	2·516	39
40	17·176	47·060	2·589	2·603	40
41	16·876	47·935	2·682	2·694	41
42	16·566	48·836	2·780	2·790	42
43	16·248	49·762	2·885	2·890	44
44	15·924	50·707	2·996	2·996	44
45	15·594	51·669	3·114	3·106	45
46	15·260	52·642	3·238	3·221	46
47	14·923	53·621	3·367	3·343	47
48	14·585	54·608	3·504	3·473	48
49	14·242	55·605	3·648	3·609	49
50	13·896	56·613	3·801	3·755	50
51	13·545	57·635	3·963	3·910	51
52	13·188	58·676	4·136	4·074	52
53	12·826	59·729	4·320	4·248	53
54	12·462	60·792	4·516	4·435	54
55	12·094	61·863	4·725	4·635	55
56	11·724	62·939	4·946	4·847	56
57	11·353	64·020	5·182	5·072	57
58	10·981	65·103	5·434	5·310	58
59	10·608	66·190	5·702	5·562	59
60	10·236	67·274	5·987	5·827	60
61	9·866	68·353	6·291	6·106	61
62	9·498	69·424	6·613	6·403	62
63	9·134	70·484	6·956	6·727	63
64	8·774	71·532	7·319	7·078	64
65	8·418	72·569	7·705	7·433	65
66	8·064	73·600	8·120	7·815	66
67	7·712	74·626	8·566	8·227	67
68	7·360	75·650	9·049	8·673	68
69	7·007	76·678	9·576	9·151	69
70	6·657	77·700	10·148	9·647	70
71	6·311	78·706	10·766	10·186	71
72	5·975	79·685	11·425	10·731	72
73	5·653	80·623	12·119	11·287	73
74	5·348	81·510	12·840	11·875	74
75	5·061	82·345	13·585	12·484	75

TABLE V.—H^{M} $3\frac{1}{2}$ *per Cent.*

Age next Birthday.	Value of an Annuity of £1.	Single Premium for an Assurance of £100.	Annual Premium for an Assurance of £100.		Age next Birthday.
			Aggregate Table.	Select Table.	
	£	£	£	£	
20	20·225	28·226	1·330	1·471	20
21	20·066	28·763	1·365	1·492	21
22	19·909	29·294	1·401	1·514	22
23	19·748	29·839	1·438	1·540	23
24	19·578	30·413	1·478	1·569	24
25	19·399	31·019	1·521	1·600	25
26	19·212	31·652	1·566	1·636	26
27	19·018	32·307	1·614	1·675	27
28	18·820	32·975	1·664	1·718	28
29	18·620	33·654	1·715	1·764	29
30	18·416	34·343	1·769	1·814	30
31	18·209	35·044	1·824	1·868	31
32	17·996	35·762	1·883	1·921	32
33	17·778	36·499	1·944	1·978	33
34	17·554	37·256	2·008	2·037	34
35	17·325	38·033	2·076	2·100	35
36	17·090	38·828	2·146	2·166	36
37	16·850	39·637	2·221	2·237	37
38	16·607	40·461	2·298	2·312	38
39	16·358	41·303	2·380	2·392	39
40	16·103	42·165	2·465	2·477	40
41	15·840	43·054	2·557	2·567	41
42	15·568	43·974	2·654	2·662	42
43	15·288	44·921	2·758	2·761	43
44	15·001	45·892	2·868	2·865	44
45	14·707	46·884	2·985	2·974	45
46	14·410	47·889	3·108	3·088	46
47	14·110	48·904	3·237	3·209	47
48	13·806	49·930	3·372	3·337	48
49	13·499	50·970	3·515	3·473	49
50	13·187	52·023	3·667	3·618	50
51	12·870	53·096	3·828	3·771	51
52	12·547	54·191	4·000	3·934	52
53	12·218	55·303	4·184	4·108	53
54	11·885	56·428	4·379	4·294	54
55	11·549	57·567	4·588	4·493	55
56	11·210	58·712	4·809	4·704	56
57	10·868	59·866	5·044	4·928	57
58	10·525	61·026	5·295	5·166	58
59	10·180	62·193	5·563	5·416	59
60	9·835	63·361	5·848	5·681	60
61	9·490	64·526	6·151	5·959	61
62	9·148	65·685	6·473	6·255	62
63	8·807	66·835	6·815	6·579	63
64	8·471	67·974	7·177	6·929	64
65	8·136	69·104	7·564	7·283	65
66	7·803	70·230	7·978	7·664	66
67	7·471	71·354	8·423	8·075	67
68	7·139	72·478	8·906	8·520	68
69	6·804	73·610	9·433	8·997	69
70	6·470	74·738	10·005	9·503	70
71	6·141	75·852	10·622	10·030	71
72	5·820	76·938	11·281	10·574	72
73	5·512	77·980	11·976	11·129	73
74	5·220	78·967	12·696	11·714	74
75	4·945	79·897	13·440	12·322	75

TABLE V.—H^{M} 4 *per Cent.*

Age next Birthday.	Value of an Annuity of £1.	Single Premium for an Assurance of £100.	Annual Premium for an Assurance of £100.		Age next Birthday.
			Aggregate Table.	Select Table.	
	£	£	£	£	
20	18·644	24·467	1·245	1·391	20
21	18·513	24·950	1·279	1·409	21
22	18·384	25·446	1·313	1·429	22
23	18·251	25·957	1·348	1·453	23
24	18·110	26·499	1·387	1·479	24
25	17·961	27·074	1·428	1·509	25
26	17·804	27·678	1·472	1·543	26
27	17·641	28·306	1·519	1·580	27
28	17·474	28·947	1·567	1·622	28
29	17·304	29·600	1·617	1·666	29
30	17·131	30·266	1·669	1·714	30
31	16·955	30·943	1·723	1·766	31
32	16·774	31·640	1·780	1·818	32
33	16·587	32·357	1·840	1·873	33
34	16·395	33·097	1·903	1·930	34
35	16·197	33·858	1·969	1·992	35
36	15·994	34·639	2·038	2·056	36
37	15·786	35·437	2·111	2·125	37
38	15·575	36·251	2·187	2·199	38
39	15·358	37·086	2·267	2·278	39
40	15·135	37·943	2·352	2·361	40
41	14·904	38·831	2·442	2·450	41
42	14·664	39·752	2·538	2·543	42
43	14·417	40·706	2·640	2·641	43
44	14·162	41·685	2·749	2·744	44
45	13·901	42·690	2·865	2·851	45
46	13·635	43·712	2·987	2·964	46
47	13·366	44·745	3·115	3·084	47
48	13·094	45·792	3·249	3·211	48
49	12·817	46·859	3·391	3·345	49
50	12·536	47·938	3·542	3·488	50
51	12·249	49·043	3·702	3·641	51
52	11·955	50·174	3·873	3·803	52
53	11·655	51·327	4·056	3·975	53
54	11·351	52·496	4·250	4·160	54
55	11·043	53·682	4·458	4·358	55
56	10·731	54·881	4·678	4·568	56
57	10·417	56·090	4·913	4·792	57
58	10·100	57·309	5·163	5·028	58
59	9·780	58·530	5·431	5·278	59
60	9·459	59·773	5·715	5·541	60
61	9·138	61·007	6·018	5·818	61
62	8·818	62·237	6·339	6·114	62
63	8·500	63·461	6·680	6·436	63
64	8·185	64·675	7·042	6·785	64
65	7·870	65·883	7·427	7·138	65
66	7·557	67·089	7·841	7·518	66
67	7·243	68·297	8·286	7·928	67
68	6·928	69·507	8·767	8·372	68
69	6·610	70·729	9·294	8·848	69
70	6·293	71·950	9·866	9·353	70
71	5·979	73·159	10·483	9·879	71
72	5·672	74·339	11·142	10·421	72
73	5·377	75·475	11·836	10·974	73
74	5·097	76·551	12·556	11·558	74
75	4·833	77·567	13·299	12·163	75

TABLE VI.

The Expectation of Life at Quinquennial Ages according to various Mortality Tables.

Age.	Northampton.	Carlisle.	Davies' Equitable.	Peerage Males (Graduated).	Seventeen Offices.	Institute of Actuaries (Healthy Males).	American Experience (1867).	Thirty American Offices (Males).	Government Annuitants* (1883).		Age.
									Males.	Females.	
20	33·4	41·5	41·1	41·6	41·5	42·1	42·2	43·1	...	...	20
25	30·9	37·9	37·4	38·7	38	38·4	38·8	39·5	...	...	25
30	28·3	34·3	34	35·6	34·4	34·7	35·3	35·9	...	...	30
35	25·7	31	30·7	32	30·9	31	31·8	32·2	...	...	35
40	23·1	27·6	27·4	28·4	27·3	27·4	28·2	28·5	26	29·8	40
45	20·5	24·5	24·1	24·8	23·7	23·8	24·5	24·8	23·1	26·4	45
50	18	21·1	20·8	21·4	20·2	20·3	20·9	21·2	20·3	22·9	50
55	15·6	17·6	17·9	18	16·9	17	17·4	17·8	17·3	19·6	55
60	13·2	14·3	15·1	14·7	13·8	13·8	14·1	14·6	14·4	16·3	60
65	10·9	11·8	12·4	11·5	11	11	11·1	11·6	11·7	13·2	65

Age.	English Life.						Selected Healthy Districts.				Age.
	No. 3.		No. 4.		No. 5.		Dr. Farr's.		Dr. Tatham's.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	
20	39·5	40·3	39·4	41·7	40·3	42·4	43·4	43·5	44·4	45·6	20
25	36·1	37	35·7	38	36·3	38·5	39·9	40·2	40·4	41·7	25
30	32·8	33·8	32·1	34·4	32·5	34·8	36·5	36·9	36·5	37·9	30
35	29·4	30·6	28·6	30·9	28·9	31·2	32·9	33·5	32·7	34·2	35
40	26·1	27·3	25·3	27·5	25·4	27·6	29·3	30	28·9	30·4	40
45	22·8	24·1	22·1	24·1	22·1	24·1	25·7	26·5	25·2	26·6	45
50	19·5	20·8	18·9	20·7	18·8	20·6	22	22·9	21·5	22·8	50
55	16·5	17·4	16	17·3	15·7	17·2	18·5	19·2	18	19·1	55
60	13·5	14·3	13·1	14·2	12·9	14·1	15·1	15·7	14·7	15·6	60
65	10·8	11·5	10·6	11·4	10·3	11·3	12	12·6	11·6	12·4	65

* At date of purchase.

APPENDIX D.

LIST OF LIFE ASSURANCE COMPANIES CONTRIBUTING TO THE COMBINED MORTALITY EXPERIENCE 1863–93.

List of Life Assurance Companies contributing to the Combined Mortality Experience, 1863–93.

Name of Company.	Estd.	Assurances.	Annuities.
COMPANIES CONTRIBUTING THROUGH THE INSTITUTE OF ACTUARIES.			
ALLIANCE	1824	*	—
ATLAS	1808	*	—
BRITISH EMPIRE MUTUAL	1847	*	*
CLERGY MUTUAL	1829	*	—
CLERICAL, MEDICAL AND GENERAL	1824	*	—
COMMERCIAL UNION	1861	*	*
EAGLE	1807	*	—
ECONOMIC	1823	*	—
ENGLISH AND SCOTTISH LAW †	1839	*	*
EQUITABLE	1762	*	—
EQUITY AND LAW	1844	*	*
FRIENDS' PROVIDENT	1832	*	*
GENERAL	1837	*	*
GRESHAM	1848	*	*
GUARDIAN	1821	*	*
HAND-IN-HAND	1836	*	*
IMPERIAL AND ENGLAND	1820	*	*
	1840	*	*
LANCASHIRE	1852	*	—
LAW LIFE	1823	*	—
LAW UNION AND CROWN	1825	*	*
LEGAL AND GENERAL	1836	*	*
LIVERPOOL AND LONDON AND GLOBE	1836	*	*
LONDON AND LANCASHIRE	1862	*	—
LONDON ASSURANCE	1720	*	*
LONDON LIFE ASSOCIATION	1806	*	—
METROPOLITAN	1835	*	—
MUTUAL	1834	*	—
NATIONAL	1830	*	*
NATIONAL OF IRELAND	1822	—	*
NATIONAL PROVIDENT	1835	*	*
NORTH BRITISH AND MERCANTILE †	1823	*	*
NORWICH UNION	1808	*	*
PATRIOTIC	1824	*	—
PELICAN	1797	*	—
PROVIDENT	1806	*	—
PROVIDENT CLERKS'	1840	*	*
PRUDENTIAL	1848	—	*
ROCK	1806	*	—
ROYAL	1845	*	*
ROYAL EXCHANGE	1720	*	*
SUN	1810	*	—
UNION	1813	*	—
UNITED KENT	1824	*	*
UNITED KINGDOM TEMPERANCE AND GENERAL	1840	—	*
UNIVERSAL	1834	*	—
UNIVERSITY	1825	*	—
WESTMINSTER AND GENERAL	1836	*	*
YORKSHIRE	1824	*	*
THE FOLLOWING AMERICAN OFFICES CONTRIBUTED THEIR BRITISH ANNUITY EXPERIENCE ONLY.			
EQUITABLE OF UNITED STATES	1859	—	*
MUTUAL OF NEW YORK	1843	—	*
NEW YORK LIFE	1845	—	*
COMPANIES CONTRIBUTING THROUGH THE FACULTY OF ACTUARIES.			
CALEDONIAN	1833	*	*
CITY OF GLASGOW	1838	*	*
EDINBURGH	1823	*	*
ENGLISH AND SCOTTISH LAW	1839	†	†
LIFE ASSOCIATION	1838	*	*
NORTH BRITISH AND MERCANTILE	1823	†	†
NORTHERN	1836	*	*
SCOTTISH AMICABLE	1826	*	*
SCOTTISH EQUITABLE	1831	*	—
SCOTTISH IMPERIAL	1865	*	—
SCOTTISH LIFE	1881	*	*
SCOTTISH METROPOLITAN	1876	*	*
SCOTTISH PROVIDENT	1837	*	*
SCOTTISH UNION AND NATIONAL	1824	*	*
SCOTTISH WIDOWS' FUND	1815	*	*
STANDARD	1825	*	*

* The above Companies contributed Assurance and Annuity Experience as indicated by the asterisks.

† These Companies contributed through the Institute and the Faculty the business transacted in their Chief Offices in England and Scotland respectively.

ACCIDENT INSURANCE.

BY

C. H. GREEN

(OF THE SUN LIFE ASSURANCE SOCIETY).

INTRODUCTION.

Accident Insurance may be said to owe its existence to the discovery of Steam Power, for with the introduction of railways in the early forties came the fear of accidents therefrom and the necessity for this branch of insurance. There are much earlier records of the insurance of Special Accident risks to persons, but it is in the year 1845 we first find companies projected to specially transact Personal Accident Insurance as it is now practised, and in that year two were "provisionally registered." No further steps were taken by the promoters and no attempt to promote a company was successful until on the 22nd March, 1849, the *Railway Passengers' Assurance* Company, which had been provisionally registered under another title the previous year, commenced operations.

The objects for which it was registered were "To insure all who do now or shall hereafter travel by railway, compensation for personal injury or loss of life consequent upon or incident to railway conveyance, whether arising from accident or negligence otherwise than wilful."

Although this would cover a much more extended range of accidents than those coming under the present day definition of "railway accident," it did not permit the company to cover "accidents of all kinds." And it was not until 1855 that fresh powers to enable it to do so were obtained.

To this Company, which has maintained its unbroken record throughout the history of Accident Insurance, and whose individual history may be said to be that of this branch of the business, must be accorded the honour of being the first in the field.

It was followed in the succeeding year by the *Accidental Death* Insurance Company which was completely registered 24th January, 1850, and whose objects were "To insure against death by Violence and Personal Injury."

Mr. Walford naturally claims for this Company, that it was the first to really transact General Accident Insurance, and, no doubt, strictly speaking, he is right. This Company had an existence of barely six years before it became merged into the *Travellers and Marine*, through which, by a series of amalgamations and transfers, the present *Accident* Company traces its history.

While these Companies were being established some of the then existing Life Assurance Companies endeavoured to anticipate their objects, and, in fact, extended this principle of Insurance to Sickness as well as Accident, offering various forms of Accidental Insurance, with and without Life Assurance, including "Annuities in the event of Blindness, Insanity, Paralysis, Accidents, or any other bodily or mental affliction totally disabling the Assured."

The year 1851 witnessed attempts to specially extend Accident Insurance to those whose occupation required them to travel by sea, and to introduce "double benefits if death resulted from a railway accident," and three years later (1854) the first announcement of a World-wide General Accident Policy appeared. 1855 claims the first and only attempt recorded to combine under one Policy Accident with Fire Insurance. In 1867 was inaugurated the combination of Life with General Accident Insurance, and the present Bonus system to policyholders of five years' standing dates back to 1870. From 1870 to 1880 no new development took place, but the year 1881 marks one of the epochs of Accident Insurance.

The passing of "The Employers' Liability Act, 1880," brought into existence competitors for the business, and undoubtedly spurred the existing Companies to increased activity.

About this time attempts were made by several of the Offices to modify some of the objectionable and restrictive conditions which had been introduced into the General Accident Policies, and the increased benefits for total loss of limbs or eyesight were re-instated after having been discontinued since 1855. From this period onward has been witnessed a steady growth of the business until the passing of "The Workmen's Compensation Act, 1897," again stimulated and induced further competition not only on the part of new Companies, but also by several of the older and wealthier of the existing Life and Fire Offices.

PERSONAL ACCIDENT INSURANCE.

Until the last few years the term Personal Accident Insurance was confined to those contracts of Insurance under which the Company agreed to pay certain specified sums of money, in the event of

1. Death.
2. Disablement { *a* permanent { *c* total / *d* partial ; *b* temporary { *c* total / *d* partial }

arising as the result of accidental bodily injury. (See definitions below.)

Since 1893, however, Accident Policies have been issued, including Weekly Compensation in the event of disablement by Typhoid, Typhus, Scarlet Fever, Small-pox, Diphtheria, and Measles, and at the same time the scope of the Accident Policy was made more comprehensive by the inclusion of a benefit in the form of an annuity (expressed as a percentage of the sum insured at death), payable in the event of Permanent Total Disablement other than that hitherto defined; and by granting "double benefits" for Death or Disablement arising as the result of "Railway Accident." The general acceptation of the term Personal Accident Insurance now includes such a Policy.

The various risks are broadly divided into three classes, the classification being based upon the nature of the occupation of the Insured.

Class I. includes the Titled, Professional and Mercantile Classes, Commercial Travellers, and Traders incurring no trade risk.

Class II. includes Master Tradesmen, such as Bakers, Builders, Grocers, Tailors, superintending but taking no personal part in the trade or occupation.

Class III. includes those engaged in Constructional and Mechanical Operations, and others, such as Butchers, Cattle Dealers, Veterinary Surgeons, &c.

Certain other occupations of a more hazardous nature are either uninsurable or are accepted by some Offices only at increased rates.

The term "ACCIDENT" is now almost uniformly defined by the Companies as—

> "bodily injury caused solely by violent accidental external and visible means capable of direct proof, and not influenced or aggravated by bodily defects or infirmities."

And "DEATH must be—

> the direct result of and be caused solely by an accident, and must take place within three months from the date of the accident."

Certain technical terms common to present day Personal Accident Insurance have acquired, from use and practice, known and definite meanings. Such are—

RAILWAY ACCIDENT.—An accident to the train in which the Insured is travelling as an ordinary passenger, in a passenger carriage and in accordance with the Railway Company's Bye Laws.

PERMANENT TOTAL DISABLEMENT.—The loss by physical separation of two limbs, or the entire and irrecoverable loss of sight of both eyes; and with some Companies the loss of an eye and a limb, such loss must be the direct result of and be caused by an accident, and must take place within three months from the date of the accident.

PERMANENT PARTIAL DISABLEMENT.—The loss of one limb or the sight of one eye, as above.

PERMANENT TOTAL DISABLEMENT to entitle to the Annuity—The absolute irrecoverable disablement of the Insured by Accident other than loss of limbs or eyesight.

TEMPORARY TOTAL DISABLEMENT varies as to its meaning.

Some Companies use the simple definition—

> Totally disabled and incapacitated from attending to his usual employment or business.

Others require the Insured to be—

> Immediately and continuously disabled as the result of the accident.

While a third section consider that the injury must be of such a nature as to—

> Necessarily, immediately, and continuously confine the Insured to the house, and totally disable and prevent him from attending to his business or to business of any kind.

TEMPORARY PARTIAL DISABLEMENT.—When the Insured has so far recovered from temporary total disablement (as defined) as to be able to perform some part of his business or when the accident has never more than partially disabled him.

Each Company fixes, according to its own experience, the age limits at which it will accept and renew business; these are generally 18 to 60, or 65, and every healthy, temperate person, without physical defect or infirmity, in the same class is insured at a uniform rate of premium, the premium remaining constant irrespective of the age of the Insured, and varying only with the benefits granted. No medical examination of the Insured is required, and the Company must rely upon the representations or signed statements of the Proposer, and upon the observance of absolute good faith not only on his part but also on that of the Agents concerned. All material points considered necessary by the Office for the proper consideration of the risk should be clearly set forth in the proposal form, which should conclude with a declaration by the Proposer that the answers given to the questions are true and complete; that he is in good health, and of strictly sober and temperate habits; that no

important relevant information has been concealed or withheld from the Company; that he agrees that the proposal and declaration shall be the basis of the contract between him and the Company whose form of Policy, subject to the terms and conditions thereof, he is willing to accept.

Great care requires to be exercised in the drafting of an Accident Policy so as to clearly define the risks insured against, and distinguish between accident and general causes. "A Policy of Insurance," observed Lord St. Leonard's, "should be framed so that he who runs may read. It ought to be framed with such deliberate care that no form of expression, by which on the one hand the party assured can be caught, or by which on the other the Company can be cheated, shall be found upon the face of it; nothing ought to be wanting in it, the absence of which may lead to such results" (Anderson v. Fitzgerald, 4, H. L. C., 484), and this applies in a marked degree to Personal Accident Insurance. Where there is any ambiguity in a Policy, the Courts will prefer that construction which favours the Insured and operates most strongly against the Company by whom it has been prepared.

The numerous combinations of circumstances under which death or disablement, more or less accidental, may occur, together with the "moral hazard" of the business, necessitate conditions in the contract of a somewhat restrictive nature peculiar to this branch of Insurance, characteristic of which is the following:—

"This Policy is only in force for one year, but is renewable from year to year on payment by the Insured of the Premium within mentioned, or of such other Premium as the Company may fix. But the Company shall not be bound to send any notice of the Renewal Premium becoming due, and shall be at liberty, should they see fit, to decline to renew the Policy at the end of any year. By notice in writing the Company may determine this Policy as from the receipt of such notice without prejudice to the rights of the Insured, in respect of prior accident or disablement, provided that the Company shall return on demand to the Insured the then last premium paid by him, less a *pro rata* part thereof for the portion of the year the Policy has been in force, and such notice shall be deemed sufficiently given if addressed to the Insured at his most recent address of which the Company shall have received notice, and shall in such case be deemed to have been received by him at the time when the same would be delivered in the ordinary course of post."

In the practical working of the business much depends upon the proper SELECTION and CLASSIFICATION of RISKS, so as to minimize the adverse selection which is always in operation against the Office.

Continuous re-classification is necessary, with special regard to the Claim Experience of the Office; and legal decisions and the continual introduction of new means of locomotion and pleasure pursuits necessitate careful consideration and periodical revision of the Policy, Proposal, and Claim Forms, if success is to be maintained.

With regard to the age limit up to which Companies are prepared to accept and renew business, the Returns of the Registrar General afford full justification for the practice that after age 60 to 65, no risks can or should be accepted at ordinary rates. An analysis of the Returns shows that the rate of mortality from fatal accidents

increases continuously with age, and to a most marked extent after age 65. This is more particularly the case with accidents of a general nature as opposed to accidents arising out of employment. The following figures are based on the Census Returns of 1891, and the Registrar General's Returns of Fatal Accidents for the three years, 1890–1892.

	Number Living between Ages 25-65.	Number Living over Age 65.	Annual Rate of Mortality per 1,000.		Ratio.
			25-65.	65 & over.	
I. OCCUPIED MALES. Those Occupations in which Accidents due to Occupation may occur	5,185,674	379,886	·9291	2·1664	2·33
II. OCCUPIED MALES. Those Occupations in which Accidents due to Occupation are not likely to occur (Commercial Clerks, Legal Profession, Teachers and Clergymen, &c.)	267,469	13,007	·3041	1·1532	3·79
TOTAL { All Occupied Males, England & Wales }	5,453,143	392,893	·8984	2·1329	2·37

There is a marked absence of literature dealing specially with Personal Accident Insurance, and questions arising under such Policies have rarely come before the Courts in this Country. Cases that have been decided by the Courts are mentioned in the legal handbooks on Life Assurance.

EMPLOYERS' LIABILITY.

Employers' Liability Insurance is a Contract of Indemnity, under which an Employer is indemnified against legal claims for reparation or compensation which may be brought against him in respect of Accidents happening to his workpeople, and the legal costs incurred in settling or contesting those claims.

These Contracts or Policies have for many years been combined with an Insurance for the payment to the workmen of Compensation on a fixed scale for those accidents of employment for which no legal liability existed, and although the passing of "The Workmen's Compensation Act, 1897," has removed much of the necessity for such an Insurance this form of Policy is still issued.

The liability to compensate workmen in the employ of a sub-

contractor which was entailed upon an employer by "The Workmen's Compensation Act, 1897," is now included in these Policies.

In the following table (pages 252 and 253) are set forth the various legal rights of action which a workman has against his employer, and on and after the 1st July, 1901, "The Workmen's Compensation Act, 1897," will apply to all workmen employed in Agriculture hitherto excluded from its benefits.

Under both "The Employers' Liability Act, 1880," and "The Workmen's Compensation Act, 1897," the workman's statutory rights of action are limited by various conditions in the Acts themselves, and a uniform definition has not been adopted for the term "Workman."

"The Employers' Liability Act, 1880," was passed with the object of destroying, under certain conditions, the Doctrine of Common Employment, and to a certain extent achieved its object, but a very large number of accidents of employment fail to come within its provisions, and owing to its faulty phraseology it has been provocative of much litigation. These and many other objections have been continually raised against it, and numerous attempts were made to amend it and to introduce a new statute before "The Workmen's Compensation Act, 1897," was successfully passed.

By the 1897 Act, our legislators have laid down for the first time in this country the doctrine that a workman, in certain specified industries, has a legal claim upon his trade for accidental injuries arising out of his employment, except such as are caused by his own wilful and serious misconduct.

Unfortunately, this Statute has been interpreted in such a manner that it fails to carry out the original intentions of its promoters, thus materially adding to the difficulties of the situation and minimizing the benefits promised to the workman. All interested have realized that an amendment and extension is necessary, and having regard to the prominence accorded to this question during the recent political campaign, it may reasonably be expected that a new measure will shortly be introduced which will consolidate the existing Law of Employers and Employed, and at the same time extend the benefits of the 1897 Act to employment of every kind and to every accident arising out of *or* in the course of employment.

Allusion has been made in the introductory notes to the competition which arose in 1897–98 upon the passing of "The Workmen's Compensation Act, 1897." At that time an attempt was made to form a Tariff Committee of the Offices interested and fix rates for the various trade risks, but it failed to secure the support of several companies, and eventually collapsed.

At present there are no standard rates, and the experience gained is insufficient to fix rates of premium or lay down definite rules for guidance in working the business.

Since the Act came into operation the Companies have continued to work upon the lines of the old Employers' Liability Combined

THE WORKMAN'S VARIOUS LEGAL RIGHTS OF ACTION AGAINST THE EMPLOYER.

COMMON LAW.

If injury is caused to a workman through his (the employer's) *personal* negligence.

Note. — In every case, other than those falling under the Employers' Liability Act, in which the master has been held liable to his servants, the injury is to be traced to his personal failure in the duty of taking reasonable precautions for his servants' safety.— *Roberts & Wallace, "The Duty and Liability of Employers," p.* 140.

Subject to the following limitations, Doctrine of Common Employment, "Volenti non fit injuria" or Consent, Contributory Negligence.

EMPLOYERS' LIABILITY ACT, 1880. [43 & 44 Vict. Ch. 42.]

1. Where after the commencement of this Act personal injury is caused to a workman

(1.) By reason of any defect in the condition of the ways, works, machinery, or plant connected with or used in the business of the employer; or

(2.) By reason of the negligence of any person in the service of the employer who has any superintendence entrusted to him whilst in the exercise of such superintendence; or

(3.) By reason of the negligence of any person in the service of the employer to whose orders or directions the workman at the time of the injury was bound to conform, and did conform, where such injury resulted from his having so conformed; or

(4.) By reason of the act or omission of any person in the service of the employer done or made in obedience to the rules or bye-laws of the employer, or in obedience to particular instructions given by any person delegated with the authority of the employer in that behalf; or

(5.) By reason of the negligence of any person in the service of the employer who has the charge or control of any signal, points, locomotive engine or train upon a railway,

the workman, or in case the injury results in death, the legal personal representatives of the workman, and any persons entitled in case of death, shall have the same right of compensation and remedies against the employer as if the workman had not been a workman of nor in the service of the employer, nor engaged in his work.

2. A workman shall not be entitled under this Act to any right of compensation or remedy against the employer in any of the following cases; that is to say,

(1.) Under sub-section one of section one, unless the defect therein mentioned arose from, or had not been discovered or remedied owing to the negligence of the employer, or of some person in the service of the employer, and entrusted by him with the duty of seeing that the ways, works, machinery, or plant were in proper condition.

(2.) Under sub-section four of section one, unless the injury resulted from some impropriety or defect in the rules, bye-laws, or instructions therein mentioned; provided that where a rule or bye-law has been approved or has been accepted as a proper rule or bye-law by one of Her Majesty's Principal Secretaries of State, or by the Board of Trade or any other department of the Government, under or by virtue of any Act of Parliament, it shall not be deemed for the purposes of this Act to be an improper or defective rule or bye-law.

WORKMEN'S COMPENSATION ACT, 1897. [60 & 61 Vict. Ch. 37.]

1.—(1.) If in any employment to which this Act applies personal injury by accident arising out of and in the course of the employment is caused to a workman, his employer shall, subject as herein-after mentioned, be liable to pay compensation in accordance with the First Schedule to this Act.

(2.) Provided that:—

(*a.*) The employer shall not be liable under this Act in respect of any injury which does not disable the workman for a period of at least two weeks from earning full wages at the work at which he was employed;

(*b.*) When the injury was caused by the personal negligence or wilful act of the employer, or of some person for whose act or default the employer is responsible, nothing in this Act shall affect any civil liability of the employer, but in that case the workman may, at his option, either claim compensation under this Act, or take the same proceedings as were open to him before the commencement of this Act; but the employer shall not be liable to pay compensation for injury to a workman by accident arising out of and in the course of the employment both independently of and also under this Act, and shall not be liable to any proceedings independently of this Act, except in case of such personal negligence or wilful act as aforesaid;

(*c.*) If it is proved that the injury to a workman is attributable to the serious and wilful misconduct of that workman, any compensation claimed in respect of that injury shall be disallowed.

(3.) In any case where the workman knew of the defect or negligence which caused his injury, and failed within a reasonable time to give, or cause to be given, information thereof to the employer or some person superior to himself in the service of the employer, unless he was aware that the employer or such superior already knew of the said defect or negligence.

COMPENSATION	COMPENSATION.	COMPENSATION.
No limit to the damages recoverable. (The question of the *amount* of damages is for the jury.)	3. The amount of compensation recoverable under this Act shall not exceed such sum as may be found to be equivalent to the estimated earnings, during the three years preceding the injury, of a person in the same grade employed during those years in the like employment and in the district in which the workman is employed at the time of the injury.	(1.) The amount of compensation under this Act shall be— (*a*) where death results from the injury— (i.) if the workman leaves any dependants wholly dependent upon his earnings at the time of his death, a sum equal to his earnings in the employment of the same employer during the three years next preceding the injury, or the sum of one hundred and fifty pounds, whichever of those sums is the larger, but not exceeding in any case three hundred pounds, provided that the amount of any weekly payments made under this Act shall be deducted from such sum, and if the period of the workman's employment by the said employer has been less than the said three years, then the amount of his earnings during the said three years shall be deemed to be 156 times his average weekly earnings during the period of his actual employment under the said employer; (ii.) if the workman does not leave any such dependants, but leaves any dependants in part dependent upon his earnings at the time of his death, such sum, not exceeding in any case the amount payable under the foregoing provisions, as may be agreed upon, or, in default of agreement, may be determined, on arbitration under this Act, to be reasonable and proportionate to the injury to the said dependants; and (iii.) if he leaves no dependants, the reasonable expenses of his medical attendance and burial, not exceeding ten pounds; (*b*) where total or partial incapacity for work results from the injury, a weekly payment during the incapacity after the second week not exceeding fifty per cent. of his average weekly earnings during the previous twelve months, if he has been so long employed, but if not, then for any less period during which he has been in the employment of the same employer, such weekly payment not to exceed one pound. (2.) In fixing the amount of the weekly payment, regard shall be had to the difference between the amount of the average weekly earnings of the workman before the accident and the average amount which he is able to earn after the accident, and to any payment not being wages which he may receive from the employer in respect of his injury during the period of his incapacity.

Insurance, which anticipated to some extent the employers' present legal liability, carefully making such alterations and emendations as their growing experience suggests.

A thorough knowledge of the laws affecting employer and employed, and of the decisions thereon by the Courts of Appeal, is essential for all those who are engaged in this branch of Insurance. There is no lack of good legal text-books on the subject, and digests of the appeal cases appear periodically, but sources from which to obtain statistics relating to accidents are few, and the information very incomplete.

The most complete available statistics are those in connection with mines and quarries, and in the Annual Reports of H. M. Inspectors for the last five to ten years, information is obtainable as to the number of fatal, and of the more serious non-fatal accidents, the number employed, and the amount of coal raised. These reports do not give any estimate of the number permanently disabled or the number of dependants, nor are any official statistics on these two points obtainable. In like manner, Accident statistics relating to railways and factories appear in the Annual Reports compiled by the Board of Trade and by H. M. Inspectors of Factories.

MISCELLANEOUS.

There remain other classes of Insurance which can unquestionably lay claim to be included under the term "Accident Insurance." Such are Indemnity or Third Party Insurance, dealing with the Common Law Liability of the individual with regard to the general public and their property—including accidents arising from Vehicles, Boilers, Lifts, and Carelessness of Workmen—the Insurance of Plate Glass, Horses, Cattle, and Carriages; Hailstorm Insurance; "Cycling," "Coupon," and the various minor risks which are undertaken by most Accident Insurance Companies of the present day.

FIRE INSURANCE.

BY

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FIRE INSURANCE.

Its Origin.

Although Fire Insurance in crude form was practised in this country in the reign of James I.—possibly earlier—and legislation giving "leave to merchants to insure their gudes" appeared on the Statute Book of his 7th Parliament, held at Perth on 1st March, 1427, the initiation of the scheme somewhat upon the lines now adopted is popularly accredited to Charles II. The latter monarch was certainly furnished with a truly appalling object lesson in the Great Fire of London, in 1666, when no less than 400 streets were laid waste, and when there fell in the flames more than 13,000 houses, besides 89 parish churches, including St. Paul's Cathedral. That memorable disaster—involving loss to the extent of nearly £11,000,000—seems to have provoked a general demand for some sort of protection against loss by fire. Previously, the City regulations had directed that all persons living in great houses should have "a ladder or two" ready and prepared for the succour of themselves and their neighbours in the event of fire; and, *in summer time*, "especially between the Feast of Pentecost and the Feast of St. Bartholomew," they should have immediately before their door a barrel full of water for quenching such fire, further, "that ten reputable men of the ward, with ten aldermen, provide a strong crook of iron with a wooden handle, together with two chains and two strong cords, and that the beadle have a good horn and loudly sounding." After such a calamitous fire it was to be expected that some change would be made in the primitive and slender precautions then existing, and a regulation was accordingly passed that each of the twelve great Livery

Companies was to provide an engine, thirty buckets, three ladders, six pickaxe sledges, and two hand-squirts. Even these engines, however, amounted to little more than a pump which only squirted as the sucker went down. In 1675 Hautsch introduced an engine, which would throw a continuous stream of water, though it had to be supplied with water from buckets. To meet the public cry for some remedy against loss by fire, the Corporation of London, in 1667, undertook the insurance of houses and shops, but this beneficial enterprise was arrested on a mandamus from the Courts of Law. Thence, until 1680, the business of Insurance appears to have been taken up in the form of underwriting by clubs and individuals.

The Pioneer.

The pioneer of Fire Insurance, upon the strict mercantile principle of a fixed payment in the event of loss for a fixed annual premium, was *The Fire Office*, which started in May, 1680, and was situated "at the backside of the Royal Exchange." It was provided with "a considerable bank of money, and a fund of free land." It had also, thus early, a brigade of its own "versed and experienced in extinguishing and preventing of the fire," and the men were distinguished by liveries and badges.

The Terms.

The terms for Insuring were 5*s.* per annum for £10 rent of brick houses, and 10*s.* for timber, which was advertised as "good husbandry," for in such an investment of 5*s.* "the age of man can in no other way repair the loss of £100." The limit was £1,000 a house, and there was a limit even to this, for only policies to the extent of 3,000 houses were to be subscribed. The nature of the security offered was in ground rents, and it was agreed that with the first £40,000 thus secured, 5,000 houses should be insured, and with each additional £10,000 a further 5,000 houses might be covered. The option of re-instatement was at first contemplated, but it was subsequently decided that the loss must in all cases be satisfied in money, "to avoid those disputes which might arise about the dimensions, form, and substantialness of building." In 1682 the result had been the Insurance of 4,000 houses, at an average Premium of £4. 10*s.* a house, making a total receipt of £18,000, and as £7,000 had already, besides charges, been paid away in losses, it appeared—Septennial Policies being mostly in vogue—that almost half the Premiums had been repaid before a fourth part of the periods for which the houses were insured had expired.

Further History.

In 1686, application was made to the Privy Council for a Patent, "for the exclusive privilege of making and registering all Assurances, Policies, and Contracts of Houses from fire within the Bills of Mortality for 31 years," and, although King James II. was most favourably disposed towards "one of the greatest designs that any

age had ever produced," it does not appear that any Letters Patent were issued. During the next two decades the practice of Fire Insurance appears to have been slowly popularizing itself in this country, and, at the end of that period, it could boast of the existence of three Companies having between them a constituency of about 40,000 members. Of those Companies but one now survives—the *Amicable Contributors*—which dates from 1696, and which Society, after changing its name to *Amicable Contributionship*, later on adopted that of *Hand-in-Hand*, by which it is now so well known. It ought, perhaps, to be mentioned here that the *Westminster* Fire Office may not be without some direct claim to the ancestry of the *Amicable Contributors*, inasmuch as, in 1717, a large number of the promoters and supporters of the latter Office instituted the *Westminster* as a protest against the *Hand-in-Hand* (or rather the *Amicable Contributionship*, as it was then called), removing its head quarters from the City of Westminster to Snow Hill. Then, as now, Insurance Offices were divided into two classes —those carried on upon the mutual system (having for their sole object the benefit of the Insured), and those on the proprietary system, carried on by shareholders with a view to profit. The *Hand-in-Hand* elected the former of these classes—a decision which has never been swerved from throughout its long tenure of existence, and which, therefore, accords to that Society the right to be considered as the pioneer of the whole co-operative system, since so largely developed. In its earlier years large retentions were in vogue, but, in 1766, the Society had a warning, losing no less than £25,758 by one fire in Cornhill, Bishopsgate, which, with other fires in that year, brought the losses up to £53,535, a total not surpassed until as recently as 1893, when it was close to its second centennial term.

Of other still existing Fire Offices, five date from the early years of the 18th century: the *Sun* (1710), *Union* (1714), *Westminster* (1717), *London* (1720), and *Royal Exchange* (1720); while only two date from the closing years of that century: the *Phœnix* (1782), and *Norwich Union* (1797).

The first Fire Office in Scotland was established in 1720; the first in Germany in 1742, and the first proprietary company in that country in 1779; the first Office in the United States was established in Philadelphia in 1752; the first in France dates from 1816; the first in Russia from 1827.

In 1726 the constitution of the *Sun* was changed from a mutual society to that of a proprietary one, and, it may be stated, this Office was the first to insure merchandise, goods, and furniture, previous insurances having been limited to buildings.

Taxation.

In 1694 stamp duty was imposed on Fire Policies, but, in 1870, it was reduced to the nominal one of one penny. In 1782 Fire Insurances were made liable to a duty of 1*s.* 6*d.* for every £100

insured, and such tax was payable on each renewal. In 1797 the duty was increased to 2*s.* per cent.; in 1805 to 2*s.* 6*d.*, and in 1816 to 3*s.* In 1864 the tax was partially remitted, and in 1869 it was repealed altogether.

An Indemnity.

Fire Insurance, on payment of a certain premium, is, strictly, an indemnity (not exceeding the sum insured) for actual loss sustained through fire and lightning, but the sum insured does not constitute admitted value on the part of the Office, whose liability is fixed by the market value of the material destroyed at the time of the fire. The risk of lightning has of late years been conceded by the Fire Offices, even when the injury discloses no apparent action of fire, for electricity is not fire in the popular sense, nor is damage caused by it necessarily damage by ignition. Explosion of coal gas without fire ensuing has also recently come within the category of loss allowed, but if the cause of the loss can be traced to the carelessness or incompetence of tradesmen, it has been abundantly established that the Insured has right of recovery at common law against the tradesman. The contract is not intended to yield benefit to the Insured in any way beyond the making good his monetary loss, and the safety to the Office obviously lies in the inconvenience to the Insured attendant upon the disturbance which a fire must involve. The amount claimable, which can in no case exceed the sum insured, is very properly regulated by the value of the property at the time of the event, quite irrespective of the original cost. In the case of

Buildings,

their then state of repair and condition have to be taken into consideration, for assuming the amount insured to be sufficient to cover their reinstatement in superior manner and materials, the contract only extends to place the Insured in the same position he enjoyed immediately anterior to the fire. If they were at the time of the fire old and dilapidated, there would be obvious benefit in their restoration as new ones. Even in those instances where Local Authority steps in and forbids the re-erection of the buildings in the same fashion and materials as before the fire—say in the cases of those of timber, thatch, or other combustible construction, which, through their nature, menace their neighbourhood, or where an existing Act of Parliament gives the power, in the event of disturbance, to call upon the Insured to set back his premises for the widening of the thoroughfare—the Fire Insurance contract, as represented by the Policy, cannot be held to cover such contingencies. The Office cannot be expected to perform an impossible reinstatement, nor to enter into the compensation for disturbance, even though the fire may have brought it all about. In overstepping the limit of a fair indemnity, the Fire Offices would cease to be of public utility, and would prove a source of temptation and danger to human life as well as to property. In other and briefer words, the Fire Offices take every lawful precaution against the occurrence of a fire becoming a desirable event to their Insured.

Reinstatement.

The power of reinstatement was given to the Fire Offices in 1763. In 1774 this power was enlarged (14 Geo. III., c. 78) and was afterwards embodied in the Act (28 & 29 Vic., c. 90) of 1865, which after reciting that "in order to deter and hinder ill-minded persons from wilfully setting their house or houses or other buildings on fire, with a view of gaining for themselves the Insurance money, whereby the lives and fortunes of many families may be lost or endangered" enacts that "it shall be lawful for the governors and directors of the several Insurance Offices, and they are thereby authorised and required, upon the request of any person or persons interested in or entitled to any house or houses or other buildings, which may thereafter be burned down, demolished or damaged, or upon any grounds of suspicion that the owner or occupier or any other person who shall have insured the same has been guilty of fraud or of wilfully setting fire to the premises, to cause the Insurance money to be laid out and expended, so far as the same will go, towards rebuilding, reinstating, or repairing such house or houses or other buildings, unless the party claiming the Insurance money shall within sixty days next after his, her, or their claim is adjusted, give a sufficient security to them that the money shall be laid out as aforesaid, or unless it shall be in that time settled and disposed of amongst all the contending parties to the satisfaction of the insurers." In electing to reinstate—a power confirmed in the Policy conditions—the Fire Office is entitled to make use of standing materials, but it becomes responsible for the miscalculations and bad workmanship of those whom it employs. The action of the fire may not be wholly apparent at the time of making the estimate of the damage, but a remedy can be legally enforced against the Office if it be subsequently found that the old walls have bulged through the weight of the new work, for which the Office may be legally liable, or that the old supports can no longer bear the strain the new conditions properly imposed on the Office. In assessing the loss on a building where the walls survive a fire, and where a money payment is desired for the purpose of re-erecting another in a fresh spot under more favourable conditions—such as for better aspect, light, atmosphere, or drainage—the Fire Office would be in order in paying only such a sum as would cover its reinstatement on its old site after deducting the value of that portion of the old building which is left sound and practicable.

Chattels.

These principles of indemnity apply equally to the Insurance of trade, household and personal chattels, but the protective resource of reinstatement is not always available, nor do chattels come within the scope of the Act before referred to. As has been already stated, an insurance of specific sums on specific objects does not constitute acknowledged value on the part of the Office. Where

such are partially damaged or even totally destroyed, the onus of proof of value still rests with the Insured, but in no case can the over-sufficiency of one item supply the deficiency of another. These remarks apply to buildings as well as to their contents. No question of sentiment can intervene. Hence, the amount that may be insured on the irreplaceable portrait of a deceased parent or relative will not of necessity be recoverable unless its intrinsic or marketable value really represents the sum claimable. Extravagant sums given for this and that will meet with cold water treatment when proof of value has to be adduced.

With respect to chattels, wear and tear, as well as the value of the salvage, form important essentials in arriving at the true estimate of the actual loss sustained and recoverable. The law rules that in the case of goods or merchandize, payment shall be made "according to the prices which such articles shall bear in the market on the day of the fire, so far as the sum insured shall extend; and, in the case of old machinery or old household goods, that the Office shall only be bound to pay such sum as shall be equivalent to the actual value on the day of the fire, without any regard to what such property may have cost when new."

With unfinished goods in the hands of the manufacturer, the cost of production, exclusive of any consideration for profits, becomes the common measure of the damage sustained. If the goods can be replaced and a basis of agreement arrived at by adding the value of the raw materials to the net cost of production, such is in most cases satisfactory, but it will be readily understood that in some instances reproduction may be essential, whilst in others, age, fashion, style, colour, &c., may have rendered their value at the time of the fire altogether out of proportion to their original net cost. So is it with machinery. The possibility of its repair must form the root of the adjustment of the loss, for, bearing in mind the general underlying principle of the Office's liability, the Insured cannot recover the full value of new machinery for the old, nor can he discard the old, if its repair be at all practicable. With the rapid strides inventive genius makes in new machinery, a very few years will suffice to bring to light, by comparison, the shortcomings of the old, so that it is well, when fires occur, to have some fair and legitimate check upon improper and ambitious aspirations. Baron Pennefather (Irish Circuit) propounded that "a criterion of the actual damage could be found by ascertaining the expense of placing new machinery, such as was in the premises before the fire, and deducting therefrom the difference in value between the new and old, seeing that the cost of repair was an element in the damage suffered by the Insured."

Misapplication of Fire Heat.

It should be clear that the Fire Office cannot be held responsible for damage to goods and utensils whilst undergoing any process in which the application of fire heat is requisite, otherwise it might be

possible to claim indemnity for want of care and skill in the manufacture—such as the over-baking of bread in the oven, the impairment of china in course of manufacture in the furnace, or grain in process of kilning or drying. Unless there be accidental fire in its ordinary signification, no liability attaches. The limit of Insurance cover would be over-reached in such instances, for example, as laundries where the goods are damaged by the over-heating of the coppers or drying-closets—through the coppers containing linen being heated without water being put into them—or whilst in process of ironing. Nor should any Office be held liable for any damage or destruction occurring to any working dynamo, transformer, motor, or other working machine, or apparatus for generating, altering, or utilizing electricity, if such damage or destruction be caused through over-running, excessive pressure, short circuiting, or self-heating. It has been well said (Angell) that "fire produced by the friction of a wheel in its axle, which consumes the wheel, is a loss of the wheel by fire. The burning of a barrel or other vessel containing quicklime which is accidentally submitted to the action of water, is a loss by fire as to the vessel, but the spoiling of the lime is not such a loss. So the spoiling or consuming of any two chemical fluids by process of combustion is not a loss by fire as to either of the substances, but as to any third body it is such loss."

Process of Combustion.

"Similarly, heat or fire produced by vegetable fermentation, as when a hayrick takes fire by its own heat, is not a loss by fire as to the vegetable collection, but as to surrounding bodies it is." With goods destroyed by spontaneous combustion, generated by effervescence or other chemical change, the *onus* rests upon the Office repudiating the claim to prove that the fire originated in this way.

Heat and Smoke.

Damage by heat and smoke, unless the effect of actual ignition, are not legitimate subjects to claim for, and it has been so held in the case of sugar spoilt by great heat through a register being closed. Misconception prevails in this respect. It should be obvious that damage to curtains and fittings by smoke arising from a paraffin lamp, the wick of which was accidentally turned up too far—or when caused by smoke emitted into the room, owing to an accidental stoppage in the chimney—should not be recoverable under a Fire Insurance contract. And in the instances of heat, no responsibility strictly attaches for a plate glass window cracked and broken by the heat of gas or from an oil stove—for a looking-glass plate, broken by the heat from a lamp placed in too close proximity to it—or to a glass globe, broken by the heat from the flame of the lamp.

The Contract.

The contract of Fire Insurance is one of good faith. Lord Mansfield has laid down that "Insurance is a contract of speculation: the special facts upon which the contingent chance is to be computed

lie most commonly in the knowledge of the Insured only. The Office trusts to his representations, and proceeds upon confidence that he does not keep back any circumstances in his knowledge to mislead the Office into the belief that any circumstance does not exist, and to induce the Office to estimate the risk as if it did not exist. The keeping back such a circumstance is a fraud, and therefore the Policy is void. Although the suppression should happen through mistake, without any fraudulent intention, yet still the Office is deceived, and the Policy is void, because the risk run is really from the risk understood and intended to be run at the time of the agreement. The governing principle is applicable to all contracts and dealings; good faith forbids either party, by concealing what he privately knows, to draw the other into a bargain from his ignorance of that fact, and his believing the contrary. The reason of the rule which obliges parties to disclose is to prevent fraud and to encourage good faith. It is adapted to such facts as vary the nature of the contract, which one privately knows and the other is ignorant of, and has no reason to suspect. The question, therefore, must always be, whether there was, under all the circumstances at the time that the Policy was issued, a fair representation, or a concealment, fraudulent or designed, or, though not designed, varying materially the object of the Policy, and changing the risk understood to be run." It is an undertaking between Office and Insured that in consideration of a fixed payment, termed "the premium," a written Policy, subject to certain conditions printed on the back, is handed over, and by this the one is bound to make good to the other any loss or damage through fire, lightning, or explosion of coal gas, which may happen to the subject matter therein specified not exceeding the sum insured thereon. The contingency covered is commonly designated "the risk."

The Conditions.

The printed policy conditions impose an obligation upon the Insured to notify to the Office any changes that may have occurred since the issue of the Policy—changes that may have increased the original risk through more hazardous occupancy, or through extra hazardous risks having since been erected immediately contiguous thereto, also the notification of other Insurances upon the same subject matter effected elsewhere, as well as removals and changes in interest. Their objects are to state definitely the extent of protection afforded, to ensure that the Office is faithfully apprised of the exact nature of the risk during the term of the contract, and to provide for the settlement of claims. Without such safeguards the Office could never properly estimate the risk it carries, it would have no opportunity of adjusting its rates as the hazard advanced, nor would it be able to guard against the evil effects of over-insurance, or reasonably control the principles on which claims should be made up and adjusted. Minus such conditions, there would be a double incentive to fraud, and although this could be met by an increase in the present rates all round, such action would be a tax on the honest for

the sake of the dishonest. When the written part of the Policy is inconsistent with the printed conditions, it has been ruled that "the former must prevail, inasmuch as the written words are the immediate language and terms selected by the parties themselves for the expression of their meaning, and the printed words are a general formula adapted equally to their case and that of all other contracting parties upon similar occasions and subjects."

The System.

The system requires that the proposer should be induced to realize the value of the property he is offering for Insurance by requests—not necessarily hard and fast requirements—for divisions in the sum to be insured and for some suitable assortment of the items. The writer has stated (*Guide to Drafting Fire Insurance Contracts*) that "it cannot be denied that in Fire Insurance drafting the interests of Office and Insured conflict. The Office seeks to give a *specific* character to its cover with an eye to ultimate salvage in the event of fire, and also for the purpose of securing premium commensurate with the amount of liability involved. The Insured has an entirely opposing object, desiring a more *general* cover, so that by such merging, the total value of his effects may be insured at a minimum cost, he well knowing from historical experience that *total* destructions are just the odd chance, and that it would only be on such chance occasion that he would suffer loss. It is hardly necessary to demonstrate the fact that a man with £500 worth of household effects, *plus* £100, the value of his pianoforte, can lump the whole together in an insurance for £400, and keep on claiming upon his Office for the total value of any of the articles destroyed, including even the disproportionate value of his pianoforte, so long as his aggregate loss in the year does not exceed the total amount insured." Thus it is customary or desirable to require separate sums on :—

(*a*) Buildings as distinct from their contents.
(*b*) Household as distinct from trade effects.
(*c*) Fixed as distinct from movable effects.
(*d*) Live as distinct from dead stock (strictly necessary if farming stock).
(*e*) Stock-in-trade as distinct from machinery.
(*f*) Private effects where coinciding with nature of goods for sale.
(*g*) Each detached building.
(*h*) Each separated building—which would mean one adjoining another, but separated therefrom by perfect party wall through and above the roof, or with its openings protected by double fireproof doors.
(*i*) Buildings of differential height or construction, unless communicating internally.
(*j*) Each block of buildings of corresponding nature and construction, under one roof or communicating internally;

as to induce, if possible, a lessening of the danger. In other words, and reversing the order, it seeks to diminish the risk of fire, and to secure adequate payment for what risk remains. There can be no doubt as to the benefit the public derive from the former of these, in having pointed out to them, not on the authority of one Office, still less on hesitating and contradictory authority, but with all the weight arising from the combined experience of numerous companies, that this or that method of construction, this or that combination of materials, this or that mode of conducting a manufacturing process, is attended by imminent hazard of fire, and in having the lesson enforced by a heavy pecuniary penalty. On the supposition that the Offices are correct in their estimate of risks, the effect, and, indeed, the intention, of their rule is not so much to put money into their own coffers as to lessen the danger, and to save themselves in the first instance, and the owners of property ultimately, from the consequences of preventible fires." Further, "while the experience of any one Office, taken by itself, furnishes a very imperfect criterion, each contributes its quota of knowledge and experience to the common stock, and the public get the benefit both of broad and trustworthy data and of that peculiar and intimate acquaintance with each different class of property or process which the conductors of one company or another are sure to possess."

Insurable Interest.

It need hardly be contended nowadays, that there must be the risk of losing before there can be a valid insurance. The Gambling Act (14. Geo. III., c. 48) forbids what is known as "wagering" Insurances or the speculation upon events, "wherein the person or persons for whose use, benefit, or on whose account such Policy or Policies shall be made have no interest" (Sec. 1). And, as further protection, it requires (Sec. 2) the insertion in the Policy of the nature of the qualification or interest, and (Sec. 3) that no greater sum should be recoverable than the actual amount or value of such interest. This far-reaching subject may be summarized in the words (Bunyon's *Law of Fire Insurance*) "that any subsisting right or interest in the property to be assured which will be recognized as such in any court, either of law or equity, is an insurable interest." Where such interest is short of sole ownership, it should be so stated in the Policy, otherwise there is the risk of voiding it, for the Policy conditions require that any interest outside the position of "absolute or beneficial owner" should have such expressly defined and described, or cover would fail. The contract upon which interest is based must be valid and enforcible in law, or an insurance upon it cannot be sustained.

Floating Insurances.

Floating Insurances covering merchandize or goods at several and separate places are convenient forms of protection, inasmuch as they do not call for the vigilance or constant revision of the

Insured because their transfer from place to place takes effect in the exigencies of business. But it is essential to full recovery that the Insurance be maintained up to the full aggregate value of the merchandize, &c., for it is the rule of the Fire Offices to make such Floating Insurances subject to one or more conditions of average. Under such condition or conditions, full protection is secured by full Insurance, and only partial protection by partial Insurance. Average is tantamount to placing the Insured in the position of the Office for the amount uncovered by the Policy—that is, the difference between the sum insured and the total value of the property included in the range of the Policy—so that, in the event of loss, he must contribute thereto by a proportionate abatement of his claim. This average condition was obligatory by statute (9 Geo. iv., c. 13), but although repealed in 1869, alongside with the duty (then payable) on Fire Insurance, it continues in force as a tariff enactment.

With respect to agricultural produce scattered over a farm, strict average (except in Ireland) is not applied by the Offices, probably from the fact that the value fluctuates according to the season, the maximum being generally reached immediately after harvest. Some hardship would be urged were full average required under such circumstances. But such Insurances rightly carry some condition, although a limited one, as to the amount to be insured, for when no stipulation in this respect existed (as was the case at one time), it was found that the farmer, by storing the produce of every field upon the land on which it was grown, could cover the contingency of any one fire for a comparatively small premium, upon the reasonable supposition that more than one fire was unlikely to occur simultaneously. In the limited condition referred to, the operation of average does not take effect unless, at the breaking out of the fire, the sum insured shall be found to be less than three-fourths of the value of the whole cover. Farm implements and live stock are exempt from average, but a limit of loss upon any one animal is required.

Arbitration.

In a disputed claim, the right to arbitration is conferred by the Policy conditions. Such arbitration may be conducted by one person, representing both Office and Insured; or by two persons, one chosen by the Office, and the other by the Insured. In the event of the two arbitrators disagreeing, then the decision rests with the umpire, who must be appointed to rule the reference by the arbitrators, before they, otherwise, do anything. Should one or other party fail to choose an arbitrator within a certain number of days after the other has given notice of selection, the single arbitrator can act as sole arbitrator, and as if chosen by both parties. The award of arbitrators or umpire is conclusive. Each party has, in most cases, to pay his own costs of the reference, and half that of the award and incidental fees. It rarely happens that any other question than the amount of the loss is the subject of reference. The

reference must be precedent to any action at law, and it in no way affects a plea of fraud afterwards. The Office, having only a secondary interest in the award, will await the Insured's taking it up by payment of the costs; and if the result shows the claim to have been excessive, it may still remain passive, and, in the event of action, may plead fraud.

The Public Duty.

In conclusion, reference to the duty of the community in respect to the avoidance of risk, so far as lies in their power both severally and collectively, falls within the scope of this article on this head. Sir Eyre Shaw (*Ethics of Fire Insurance*), late Chief Officer of the Metropolitan Fire Brigade, is, entitled to be heard. He says:—"It would appear to be for the general interest to reduce material losses by fire in all reasonable ways, the most obvious of which would be by careful and thoughtful building; by classification of the contents of buildings in accordance with their nature and the several risks attaching to them; by methodical watching and inspection in the case of exceptionally valuable property; and by having means of extinguishing fire always ready within a reasonable time. Careful and thoughtful building consists of a combination of a good design, a safe site, a solid foundation, a moderate area, a limited height, a suitable shape, a cubical capacity in accordance with general circumstances, properly-constructed walls, roofs adapted to the other parts of the structure, well-placed internal divisions, chimneys sufficiently thick and high to carry the products of combustion over the top, and each separate from every other (from the hearth to the outlet), staircases and stairs suitable in materials, position, and general arrangement to the requirements of the place, floors adapted to the weights to be carried and the uses for which they are destined, and attention to the number and size of the separate risks."